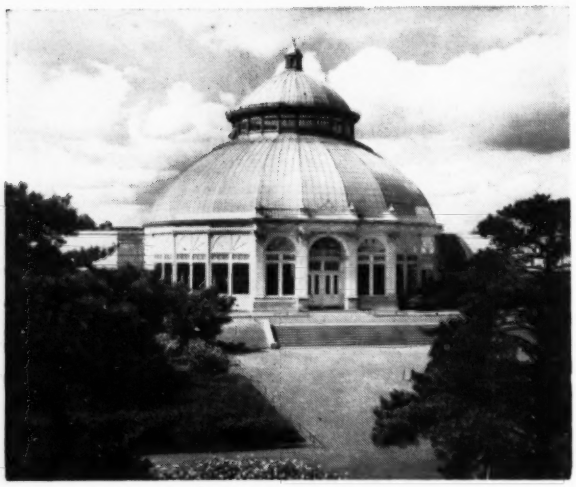
THE GARDEN JOURNAL

OF THE NEW YORK BOTANICAL GARDEN

Vol. 7, No. 2 March-April, 1957



International Flower Show: March 31 — April 6, at the Coliseum. The New York Botanical Garden will exhibit a vegetable garden.

Arbor Day Program at the Garden: April 10.

Easter Show in the Conservatory: April 12-28.

Spring Garden Tour: May 8, to gardens in Westchester County, New York.

Children's Flower Show: May 18 in Museum Building.

THE GARDEN JOURNAL
of The New York Botanical Garden

DOROTHY EBEL HANSELL
Editor

CONTENTS
March - April, 1957

A Fragrant Garden for the Blind	*Lois Wilson*	33
Busman's Holiday	*William J. Robbins*	36
A European Rose Circuit	*Edwin De T. Bechtel*	39
A Garden of Ten Million Bulbs	*Murray Wright*	42
Mulches and Fertilizers for Rhododendrons	*Warren Baldsiefen*	43
Gardening with Potted Plants	*Kathryn S. Taylor*	44
Miniature Roses	*Margaret Pinney*	46
The Dogwood Borer	*John C. Schread*	49
Sowing Seeds in Flats	*T. H. Everett*	50
English and Irish Daffodils	*Kenneth D. Smith*	54
Plastic Greenhouses for Home Gardeners	*E. M. Emmert*	56
Youth Program at The New York Botanical Garden		58
Book Reviews		63
News, Notes and Comments		66
Let There Be Herbs	*Gertrude B. Foster*	68

AMONG OUR CONTRIBUTORS

LOIS (MRS. J. R.) WILSON, member of the board of the Garden Club of Toronto and chairman of the Fragrant Garden Committee for the past two and a half years, is also garden consultant for "Canadian Homes and Gardens." Her special interests are growing foxgloves in the north woods, Wuskoka, and making flower arrangements. Two of her arrangements appeared in "Flower Arrangement Calendar 1957" edited by Helen Van Pelt Wilson . . . DR. WILLIAM J. ROBBINS is Director of The New York Botanical Garden, President of the American Philosophical Society, Treasurer of the National Academy of Sciences, and Trustee of the Rockefeller Institute for Medical Research . . . EDWIN DE T. BECHTEL, eminent rosarian, is a member of the Board of Managers of The New York Botanical Garden . . . MURRAY WRIGHT practices gardening in England . . . WARREN BALDSIEFEN is well qualified to review the important subject of mulches and fertilizers for rhododendrons, as he grows rhododendrons professionally and travels about the country to observe them in the establishments of other growers, in private gardens, and in their natural habitat. His article, reprinted in these columns with the permission of the Editor of the Quarterly Bulletin of the American Rhododendron Society, from the January 1956 number, presents a careful evaluation of mulches and fertilizers—of service to both the amateur and professional grower of rhododendrons . . . Several coveted awards have been conferred upon KATHRYN (MRS. LUCIEN B.) TAYLOR. She is the recipient (the first, in 1955) of the Medal for Distinguished Service to Horticulture of the Garden Club of America and also the silver Buckley Medal of that organization, a special award from the National Council of State Garden Clubs for horticultural achievement and also a literary achievement award, and the Distinguished Service Certificate of the Garden Club Federation of Massachusetts. Mrs. Taylor taught horticulture at the Boston School of Occupational Therapy, at Lowthrope School, and for the past three years has been instructor in practical gardening and greenhouse work for the Massachusetts Horticultural Society. She is co-author of *Winter Flowers in the Sun-Heated Pit* and editor of *A Traveler's Guide to Roadside Wild Flowers, Shrubs and Trees of the United States*, lecturer on horticultural subjects and wild flowers, and president, since 1951, of the New England Wild Flower Preservation Association . . . MARGARET (MRS. ALEXANDER) PINNEY has made a thorough study of miniature roses and has a remarkable collection of these tiny plants in her home garden in Armonk, New York . . . DR. JOHN C. SCHREAD is Associate Entomologist at the Connecticut Agricultural Experiment Station . . . T. H. EVERETT is Horticulturist of The New York Botanical Garden. KENNETH D. SMITH is already known to readers of The Garden Journal as a breeder and grower of fine iris; he also breeds and raises daffodils and day-lilies at his country home in Dongan Hills, Staten Island. His garden is a vision of loveliness, a rainbow of delicate coloring, as the daffodil season passes to the iris and the iris to the day-lilies . . . DR. E. M. EMMERT is a member of the Department of Horticulture of the University of Kentucky and has distinguished himself by pioneer work on plastic greenhouses at the University's agricultural experiment station . . . GERTRUDE B. FOSTER is editor of Herb Grower Magazine.

CREDIT FOR ILLUSTRATIONS

We are indebted to the Display Committee—Mrs. Charles Burlingham, Mrs. Richard Meredith, Mrs. Donald B. Straus—for the selection of the front cover illustration; photo by F.lli Alinari Venezia—Bibloteca Marciana—Breviario Grimani; p. 34, Panda Photography, Toronto; p. 35, Max Fleet, Don Mills, Ontario; pp. 36, 37, courtesy Botanical Garden, Meise, Belgium; p. 38, Dr. William J. Robbins; p. 40, lower left, Foto Fürstenberg, upper right, Mrs. E. De T. Bechtel; p. 41, Mrs. Bechtel; pp. 42, 43, Murray Wright; p. 44, Paul E. Genereux, courtesy Horticulture; p. 45, P. I. Merry, courtesy Mrs. L. B. Taylor; p. 47, Ralph S. Moore, Visalia, Calif.; p. 48, lower left, Ralph S. Moore, upper right, Thomas Robinson, Porchester Nurseries, England; p. 49, Dr. John C. Schread; pp. 50, 51, 52, T. H. Everett; pp. 54, 55, J. E. Downward, F.I.B.P., Woodford Green, Essex, England; pp. 57, 58, 59, 60, E. N. Mitchell.

The Garden Journal of The New York Botanical Garden is published bimonthly by The New York Botanical Garden, Bronx Park, New York 58, N. Y. Printed in the U. S. A. Re-entered as Second Class Matter, February 1, 1951, at the Post Office at New York, N. Y., under the Act of August 24, 1912. Annual subscription, $2.00. Single copies 35 cents. Foreign countries and anywhere outside the continental United States, 50 cents a year extra.

A Fragrant Garden for the Blind

By **Lois Wilson**

ONE OF THE most interesting public gardens in Canada, a garden especially designed for the pleasure and recreation of blind people, was presented to the National Headquarters of the Canadian National Institute for the Blind by the Garden Club of Toronto last September.

It is known as the Fragrant Garden and is a part of the fourteen acres of grounds of the Canadian National Institute for the Blind on Bayview Avenue in Toronto.

Even in the short time it has been open, the scope of its use in Toronto has widened. The Institute, seeing the great pleasure which their members find in the garden, and realizing the possibilities for therapeutic value in it, have declared it open to anyone and have especially invited all senior citizens in the city to make special use of it.

Interest in the design and the plant material of this garden has become widespread and special inquiries for information from groups planning similar gardens have come to the Garden Club from many cities in the United States and Canada, and from Australia, South Africa, and Chile.

THE PLANNING BEHIND THE GARDEN

The Garden Club of Toronto began to plan this Fragrant Garden for the Blind almost two years ago in three ways. First, we consulted the blind people themselves. Secondly, we asked the help of experts in all the related fields of gardening, including trees; and while all this was going on, we were writing all over the world for advice from anyone who had ever made a garden for the blind, or who had written special information about scented plants. By far the most important of these preliminary steps was consultation with the blind, and the discovery, through those consultations, of the things that would mean the most to them.

Preliminary consultation with those who will use a garden is, of course, the planner's first responsibility. Yet far too often, with almost an overdose of good-will and enthusiasm, projects like this are conceived and completed to a careful and sometimes brilliant pattern, but unrelated to the people for whom they are made. Parks, playgrounds, gift plantings, and feature gardens are too often designed on the architect's drawing board with people already drawn in. Too seldom are careful surveys made beforehand to discover what the folkways and customs are of the people who will use those parks or playgrounds or gardens. Too often we see them empty of the very people for whom they were made.

We have done our best not to make that error in this Fragrant Garden for the Blind. We have made every effort to find out, before we ever put spade to earth, what were the tangible and intangible things needed, and wished for, in such a garden by the blind people themselves.

Of the tangible things needed, by far the most important was an exercise walk where blind people, whether they like gardens or not, could go for a walk every day to keep fit. Also readily identifiable signals were needed, such as a change in the texture of walks, to make it possible for the blind to learn to use the garden alone, without guides. It is easy to forget, when one has the gift of sight, what a cherished freedom independence of movement can be. It was found very early in talks with the blind, that they were hoping to be able to discover the delights of this Fragrant Garden without the help of sighted guides.

It is also a fact that only one third of all registered blind (that is, the industrially blind) are totally so. Of the others, another third can see large shapes, and the last third can distinguish large sections of one color, as well as form.

This then, meant that the Fragrant Garden must be planned not only for the totally blind, but for the partially sighted too. When, to this group, were added all the fully sighted workers who bring the daily population of the Canadian National Institute for the Blind to nearly a thousand people, and the many hundreds of sighted visitors who come from all over the world to see the unique work of this Institute, we realized that the Garden must be beautiful to look at, as well as pleasant to smell and touch and hear.

The Planning Committee also learned that blind people get great pleasure from changing sensations. Sometimes they like to sit in the sun, sometimes in shade. Sometimes they like to feel delicate textures, sometimes coarse rough ones. Sometimes they like to smell shy scents, sometimes pungent ones. These changes not only give them delight by their variety, but excitement in discovery. Once become familiar, they also act in a very practical way, as a myriad of minor and major signals to the blind person to tell him where he is in the garden.

The next step was to choose a site and a plan that would give full scope to these needs and wishes of the blind; and with the help of J. Austin Floyd, M.L.A. a site was chosen in the very heart of the Institute grounds. It is a quadrangle, over an acre in size, and almost surrounded by the various buildings of the Institute. Doors lead into it from all the different buildings, none of which are more than two stories high. It is open to the northwest which is an advantage in summer, for this opening will channel into the garden the prevailing cool breeze. Because it is on a hilltop, it seems to be near the sky. The soil was from fifteen to twenty-feet deep of fine blow sand, deposited there many thousands of years ago when this land was a beach or sandy bay of Lake Iroquois, the larger predecessor of the present Lake Ontario.

Mr. Floyd was retained to design the garden; Professor Goodwin Wilson of the Ontario Agricultural College, Guelph, and A. H. Gray, Provincial Horticulturist of the Province of

Ontario, were consulted on building up the soil. Professor James Taylor and John Weall of the Ontario Agricultural College in Guelph, W. R. Oliver of the Dominion Experimental Farms in Ottawa, and Henry Teuscher of the Montreal Botanical Garden were asked for suggestions for suitable fragrant plants for the garden. F. Earle Martin of Cedarvale Tree Experts, Toronto, was consulted on trees. Checking all this information with plant lists of other fragrant gardens and books on scented plants, and with the blind, a master list was made up. From this, Miss Helen Kippax, A.C.L.A., a member of the Committee, made a planting plan and Minerva Castle of Rowancroft Garden, Meadowvale, also a member of the Committee, selected and provided suitable varieties of plants to fit that plan.

The Design of the Garden

Mr. Floyd's landscape design is contemporary, and the construction is carried out in materials to complement the buildings. He has been sensitive, too, as all are who make gardens these days, to the need to keep maintenance requirements low; and he has used pavings, hard surfacings, mulch, and groundcover to keep labor to a minimum. Miss Kippax' planting plan has also been made with an eye to material which, when mature, will need only housekeeping maintenance, except in the nine raised beds which will feature a succession of flowering bulbs, then summer annuals, and autumn flowers.

Because of the primary need for a special walk for exercise, the shape of this walk determines the main form of the garden. It is rectangular, seven hundred feet long, and frames the outside edges of the garden. Other traffic paths between one door and another of the buildings are routed around it, so that people crossing the garden will not bump into walkers taking exercise. The surface of this exercise walk is asphalt over concrete, changing to panels of pebbled concrete at the corners to alert the walkers that it is time to turn. All turns in this walk are right angles, since sharp corners are easier for the blind to follow than rounded ones. For more advanced and adventurous walkers two auxiliary walks were designed. One, approached by walking down a slight ramp, passes by a little avenue of lilacs and flowering crabs underplanted with English violets. The other, designed with curves, winds through plantings of fragrant small trees and shrubs. These two walks also have different surfaces to identify them, one of crushed tile, the other pebbled concrete. All walks are bordered with a precast concrete tile to create a different sound when a shoe or a cane taps the edge of the walk, and this is the only edging. There are no curbs and no railings.

Beds for evergreens and fragrant flowers are raised sixteen inches above the ground and are constructed in warm buff brick to match the buildings. The coping is turquoise tile to match the edging of the walks. There is a toe space around the base of these beds, similar to that under kitchen counters, so that people may stand close to examine and smell the flowers and shrubs. Labels, stamped in both regular lettering and Braille, identify all material within reach. Material beyond hand's reach is labelled in the regular way.

In the angle formed by two wings of the residence, there is a sun terrace sheltered by a turquoise translucent fibreglas canopy, thirty feet square, in the shape of a double butterfly. In summer, water is piped up the supports of the butterfly, sprays over the translucent fibreglas, and drops with a tinkling and splashing sound on to a white marble figure in the pool below. This figure was designed by Elizabeth Wyn Wood, one of Canada's outstanding sculptors, especially for the garden. A small miniature of it will stand on a pedestal near the fountain so that the blind may see it by touch. A bench surrounds the pool so that people may sit near the water, even dabble their hand in it, and yet not be in danger of stumbling into it. Chairs and settees have been especially designed for this terrace and have been reeded in willow by the blind themselves.

The Plants of the Garden

Of all the plants, the most beautiful and certainly by far the most glamorous are the twenty sixteen-foot white pines planted for us by Cedarvale Tree Experts during the winter of 1956.

Why, when other varieties of pine

A blind member of the Canadian National Institute for the Blind and his blind wife, with their little sighted daughter, feel the miniature of the white marble sculptured figure, "Sounds Assembling" by Elizabeth Wyn Wood. It is mounted at hand height and on a spindle so that the blind people may turn it all around to "see" it.

A full view of the Fragrant Garden for the Blind, given by the Garden Club of Toronto to the Canadian National Institute for the Blind. The Garden is almost entirely surrounded by the buildings of the Institute, where one hundred and fifty live in residence and over seven hundred blind and partially sighted people come every day to work.

A small corner of the hay-scented fern and violet groundcover for the wild garden is seen in the lower right foreground. Not seen, but in this section also, is the small rose garden presented by the Colchester Rose and Horticultural Society of Colchester, England.

are known to be hardier under urban conditions and why, when regular nursery stock would have been safer to plant and cheaper, were sixteen-foot white pine chosen?

White pine *(Pinus Strobus)* was chosen because its fragrance and its soft swishing sound in the wind gives greater pleasure to the blind than any other variety. White pine is also indigenous to the area surrounding the site, and although the pollution of the air is heavy here from encroaching new urban building, the plant consultants hope that it will be possible to grow these pines well. One thing that would help immeasurably, as it would all who plant evergreens in cities, would be to find a detergent that could be used to wash off such trees at regular intervals without being harmful when absorbed.

The committee went to the expense of moving in sixteen-foot trees because this Fragrant Garden is, in a sense, a public garden. Many people have contributed money or talent to it who are not skilled gardeners and have neither the understanding of nor the appreciation for the slow maturing of plants. The Garden Club of Toronto believed that if it could plant trees in large sizes this, more than anything else, would make the garden look more beautiful right from the start and, as well, give more immediate pleasure to the blind.

We continued this policy of planting trees in large sizes when Sheridan Nurseries donated two fifteen-foot littleleaf lindens and a large whitebeam, and ten twelve-foot trembling aspens were also planted. The lindens were chosen for their haunting June fragrance, the whitebeam for its tactile interest, and the aspens for their crisp fluttering sound in the slightest breeze. Some think these aspens were a foolish choice for the garden. We realize that this objection may prove to be valid and look upon the planting as a calculated risk. The committee is prepared to take them out, if they become a nuisance and are not a compensating pleasure for the blind.

It would, perhaps, be of interest to know that all the large trees were moved in by the supplying nursery, Cedarvale Tree Experts, under a three-year guarantee, which stated that they would be replaced if they died or looked sickly. The nursery also included in its price all expert care needed on the trees for three years, that is, pruning, spraying and special feeding.

The Garden Club of Toronto is at this time very seriously considering the establishment of a policy, for all gifts for planting in the future, that prices quoted by nurseries shall include expert care for three years. Although the Fragrant Garden is by far the most ambitious project attempted by the Club, it has, in the last ten years, given or assisted with five other projects which have involved gifts of plant material. It has sometimes happened that, through lack of knowledge on the part of those receiving these gifts, the plant material has died or has become so tacky the Garden Club has been ashamed of the gifts in a very short time.

In the past, the Club has tried to educate the recipients of gifts to their responsibilities by stipulating that they must supply for their project a plan drawn by a qualified landscape architect, and that before the Club will make the gift they must agree to a program of regular care and maintenance of the planting. This policy will be continued; but the Club is considering a new policy in which it will provide with future gifts three years of expert care, that is, pruning, spraying, and feeding. It will do this not only in the hope that the plant material will be properly cared for in its crucial years of becoming established, but also in the hope that those to whom the plant material is given will learn the value of this expert care and will budget to continue it themselves when the three years are over.

The Garden Club's arrangement with the Institute for the Blind follows this policy. As well as the three-year program of expert care for the large trees in the Fragrant Garden, the Club has given a special grant toward the salary of a skilled gardener to establish the other plant material in the garden. We feel sure that in this way, we are not only fulfilling our responsibility to establish the plant material with skill and care, but we are doing all that we can to demonstrate to others the value, in beauty and economy, of such skill and care.

Other trees and shrubs in the Fragrant Garden were chosen for their sweet fragrance, like the daphnes and viburnums. Others, like the broad and needle evergreens, were chosen for the tactile pleasure they give the blind in

(Continued on page 53)

Busman's Holiday

By **William J. Robbins**

Continued from January-February issue

FROM EDINBURGH our program took us to Copenhagen because of my special interest in the work of Dr. Schaffalitsky de Muckadell on the juvenile and adult stages of the European beech. I spent a most profitable day at the Arboretum at Horsholm outside of Copenhagen, where I also had the pleasure of lunching with the Director, Dr. C. Syrach Larsen, an old friend of Dr. David Keck.

On trips to North and South Zeeland we became acquainted with a typical Danish farm of some twenty acres with its cows, a horse or two, hogs which have been bred to have two extra ribs, and the arrangement of house and barns around a courtyard. These trips made more real the history of the country and its present economic and social organization.

We spent a day going by ferry and bus to Landskrona, Malmo, and the University of Lund, Sweden, which I had visited many years before.

Denmark is a tight little welfare state but private enterprise still exists. For some reason, perhaps because of tax restrictions, the film "Gone With the Wind" was not shown in Copenhagen but was on view at Landskrona, Sweden, some thirty minutes by boat across the sound. An enterprising Dane initiated a ferry service from Copenhagen to Landskrona, the film ran for two years, and he made a fortune. He now has four ferry boats, each with the last name Scarlett—ours was the Hannah Scarlett — to carry Danes to Sweden where bargains in canned goods are bought, not to mention tax and duty-free chocolate and cigarettes on the boat, and Swedes to Copenhagen for dairy products, fresh vegetables, and fruits.

We heard many stories of the German occupation, some true and some perhaps not. King Christian was much beloved by the Danes who took comfort and pride in seeing him ride on horseback, unattended, through the streets of Copenhagen. On one occasion, a small boy standing at attention at the curb as the king passed was asked by a German soldier what he was doing. "I am watching my king," said the boy. "But," said the German, "that is not your king. He has no guards with him." "Ah," said the boy, "He has me!"

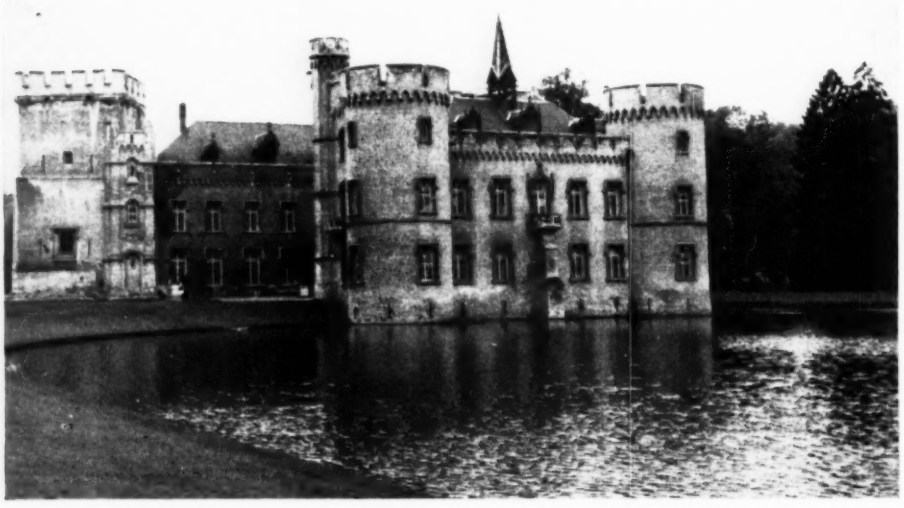
On another occasion a German functionary advised King Christian that Germany intended to annex Denmark. "Tell Hitler," said the King, "this is impossible. I am too old to administer such a large country."

Then, there is the story of the Nobel prize winner which I know to be true. Having waited until the last moment as the Germans advanced to occupy Copenhagen, he was not sure that he could make his escape. If captured, he knew that his gold Nobel medal would surely be appropriated by the Germans; he dissolved it in *aqua regia*, set the unmarked bottle on a shelf and left. After the war, he recovered the gold and a new medal was struck by the Swedish Government.

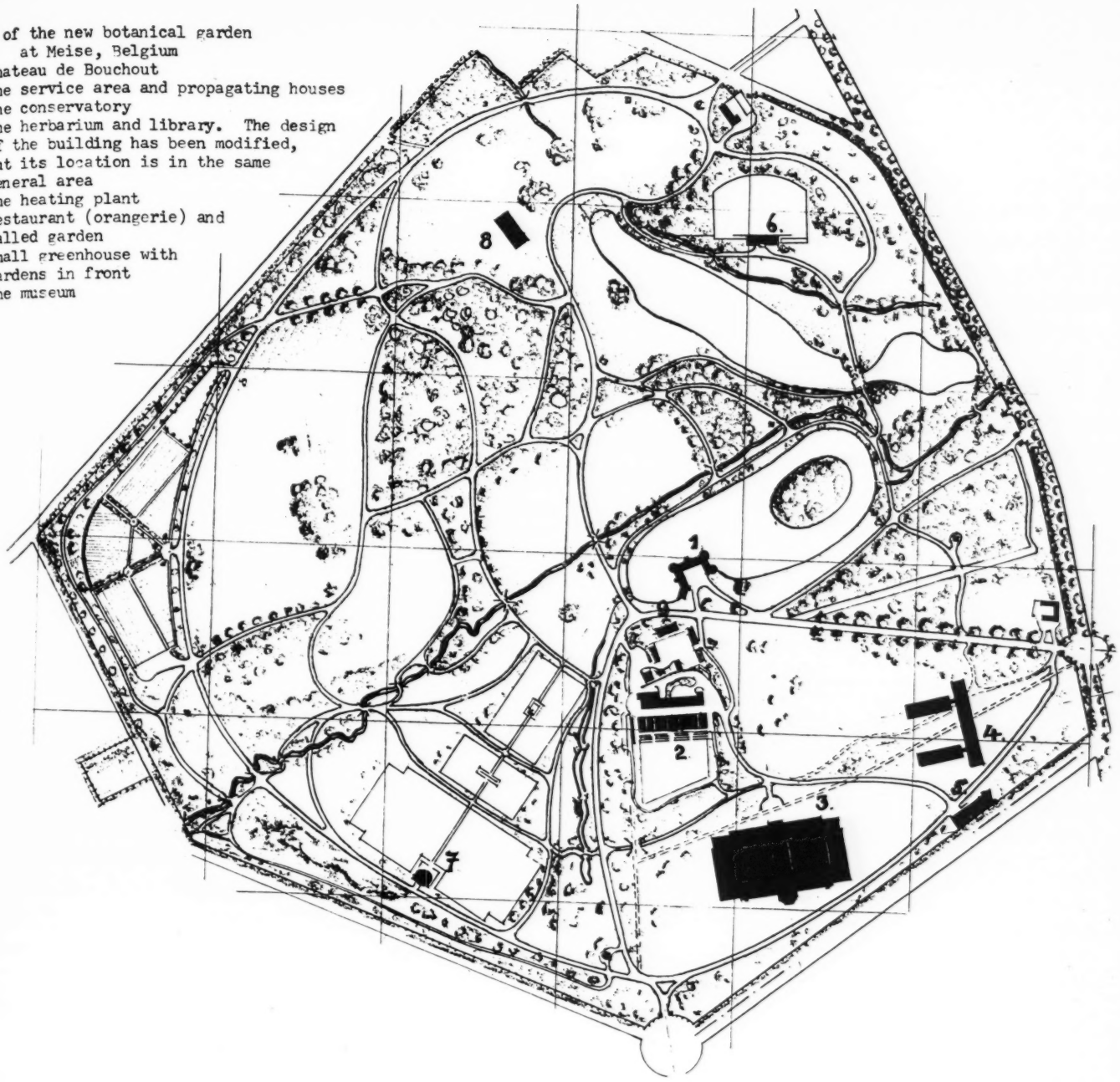
Our next stop was Amsterdam, from where I planned to visit the laboratories of Professor S. J. Wellensiek at Wageningen and those of Professor V. J. Konigsberger, as well as the herbarium, at Utrecht. In addition, Mrs. Robbins wished to investigate eighteenth century Dutch furnishings.

At Wageningen I was met by Dr. K. Verkek who kindly acted as my guide and mentor. I discussed the problem of juvenility of apples and of *Hedera* with Prof. Wellensiek and with P. M. Felius and J. J. Karpes. Dr. Chr. I. Gorter acquainted me with her intriguing research on the cultivation of cyclamen embryos and asparagus seedlings and with substances which have auxin-like activity. Dr. Verkek described his work on cabbage, Brussels sprouts and beets, aimed particularly at the conditions required for flowering and seed production.

At Utrecht, Professor Konigsberger graciously showed us through his laboratories designed primarily for the study of the effect of light on plants; these laboratories are marvels of compactness and ingenuity. We discussed also the mechanism by which auxin exerts its effects on plant growth. Prof. Konigsberger is actually living on borrowed time because during the last war he was sentenced to be shot and spent a year and a half in a concentration camp waiting for his execution. As he put it, either he became too thin to be hit by a rifle bullet, or the Germans forgot him. One member of the botanical staff was executed; his picture hangs on the wall in the library above his



Chateau de Bouchout in the new botanical garden at Meise, Belgium


Plan of the new botanical garden
at Meise, Belgium
1) Chateau de Bouchout
2) The service area and propagating houses
3) The conservatory
4) The herbarium and library. The design of the building has been modified, but its location is in the same general area
5) The heating plant
6) Restaurant (orangerie) and walled garden
7) Small greenhouse with gardens in front
8) The museum
1
2
3
4
5
6
7
8

private library, which was presented to the institution.

In the absence of Prof. W. Lanjouw, Dr. F. P. Jonker showed us through the herbarium; and we joined him and Mrs. Jonker for lunch, during which we discussed the new house which they will soon occupy, their work in Surinam, and their visit to the United States last winter. The relations between the University of Utrecht and The New York Botanical Garden are especially close because of a common interest in the flora of northern South America.

A trip by boat and trolley to Marken and Vollendam, a visit to the Hague, and to a number of museums in Amsterdam, a rijstafel at the well-known Bali restaurant, and a tour of the canals at night occupied the balance of our time. We found of special interest the exhibit of Jewish relics in the Amsterdam Historical Museum and the rooms and furniture now being installed by the Sophia-Augusta Foundation in the Stedelijk Museum. These rooms taken in toto from the home of a wealthy banker of the early part of the eighteenth century, include kitchen, dining room, living rooms and bedroom, and illustrate in dramatic fashion the luxury enjoyed by a wealthy man of that period in Amsterdam.

We flew from Amsterdam to Brussels mainly to see Professor W. Robyns and the new botanical garden which he is developing at Meise just outside Brussels. As incidental activities we visited Bruges and Ghent, had lunch with Prof. Robyns in the lovely University Club built after the first World War, drank Trappist beer, and toured some of the local museums.

These non-botanical activities some-

Not all Paris is parks and gardens — view from our hotel window

times yielded unexpected results. For example, I learned that some thirty miles of the Lys River, which runs through the famous lace-making regions of Belgium, is noted for its effectiveness in flax-retting because of a special indigenous micro-flora, and that French fried potatoes were actually invented in Belgium.

In a window of one of the restaurants I saw a basket of *Boletus edulis* and remarked to Mrs. Robbins that we should have a meal there, something our time did not allow us to do. Later in the Museé Royaux I found two paintings dating from about 1600 in which *Boletus edulis* was shown; indisputable evidence that for at least three hundred and fifty years this mushroom has been appreciated in Belgium. I mentioned this to Gordon Wasson, a member of the Board of Managers of The New York Botanical Garden and an expert in this field, and found, somewhat to my chagrin, that he not only knew of the paintings but was reproducing them in a forthcoming book.

We had planned to visit the Arboretum Terveeren near Brussels, planted by Professor J. E. Bommer in 1902 with trees from various continents including North America, but our schedule did not permit us to do so.

Brussels is in a state of turmoil with a great deal of construction under way in anticipation of the World's Fair to be held there in 1958.

The Jardin Botanique de l'Etat originated as the Societé Royale d'Horticulture des Pays-Bas, which was founded in Brussels in 1826 and renamed the Societé Royale d'Horticulture de Belgique in 1837. In 1870 it became the State Botanical Garden. Because of its location in the heart of Brussels, encroachments have been made on its grounds, and in 1938 an estate of some two hundred acres at Meise, about seven miles from Brussels, was purchased and plans made to move the garden to this new site. The development of the new garden is now proceeding rapidly under the energetic supervision of Director Robyns, and with the farsighted support of the Minister of Agriculture, M. R. Lefebvre.

The most striking item in the grounds of the new garden is the Chateau de Bouchout, a castle which stands at the edge of a small lake and dates, in part, from the twelfth century. It was purchased by King Leopold II for his sister, Empress Charlotte, widow of Maximillian, who lived there from 1879 until her death in 1927, nearly fifty years later. (Maximillian, 1832-1867, the second son of Archduke Francis Charles of Austria, early displayed an interest in botany. He married Princess Charlotte, daughter of Leopold I of Belgium in 1857 and in 1859 made a botanical expedition to Brazil. He became Emperor of Mexico in 1863 and was executed in 1867.) During the last war the castle was occupied first by the Germans and later by units of Montgomery's "desert rats." Relics of these occupations exist as military signs on walls and missing bits of the castle.

As we drove into the garden through an impressive avenue of beeches and saw the castle standing by the lake, a fairy tale seemed to become real. We walked through the great hall, the dining room, kitchens, tower rooms, the lovely blue room, and the apartments and in imagination peopled it with the noble seigneurs who once lived there, poor Charlotte who sat long hours at a second floor window looking out over the park, and the German and British troops who had left the marks of their presence. The castle is to be rehabilitated and used as a center for meetings, flower shows and special exhibits.

A conservatory covering about two and a half acres is under construction, built as a square-cornered figure eight with separate houses for special collections in the loops of the figure eight. Director Robyns calls the conservatory "le palais des plantes" and expects to plant it in such a way that the visitor will move from continent to continent.

I was especially interested in the heating system for the conservatory, which is located in spacious twin tunnels under the foundation. In one, air circulates over heating pipes, passes up into the conservatory and returns over the pipes for reheating; the other permits servicing. This arrangement avoids unsightly heating pipes in the conservatory.

The rich holdings of the library and the extensive herbarium will be housed in a modern building, a model of which I saw through the courtesy of M. Lefebvre. An orangerie will become a public restaurant and an adjoining walled garden of about two and a half acres forms an experimental garden. A building to house a museum and educational activities is to be constructed.

It is most encouraging to find that the Belgian government recognizes the importance of the botanical garden and is making provision for its aesthetic, scientific, and educational aspects. We left Brussels for Paris with the hope that we might return to see the new garden in its final and completed state.

We were fortunate to find, on arriving in Paris, sunny and mild weather. Our major purpose there was to participate in a conference on the contributions made by French botanists to the study of the flora of North America (I am reporting separately on the conference, to be published in a coming

(Continued on page 41)

Dr. Joseph Ewan of Tulane discusses a specimen during a study tour as part of the conference on the contributions of French botanists to the study of the flora of North America

A EUROPEAN ROSE CIRCUIT

By **Edwin De T. Bechtel**

THE ARTICLES on English roses in recent numbers of THE GARDEN JOURNAL did not refer to roses or hybridizers in western Europe. This summary of my talk at the October meeting of the American Rose Society at Louisville, Kentucky, and of my detailed report to that Society for its Annual, and of our meetings with Wilhelm Kordes, will outline our rose circuit from Paris and Geneva to Hamburg and Copenhagen.

The last will come first, with an introduction to Svend Poulsen of Copenhagen and Kvistgaard, which is near Hamlet's reputed castle at Elsinore. Here, opposite the coast of Sweden, across the straits, the cold winds of the Baltic sweep over the many acres of Poulsen's large nursery of trees, shrubs, and other plants, protected by screens of sturdy firs. His hybridizing and seedling greenhouses are adjacent to his pleasant country-house, cleverly designed to resemble an ancient Danish farm house. Years of hard work and devotion to his plants and trees have marked his face with a touch of asceticism. Predominating are his dignity, enthusiasm, and friendliness.

After the welcome we received from him and his family and long conversations about roses, it seemed as though we had known him for many years. He has, indeed, given most of his long life to the origination and culture of roses which are best adapted to the rigorous climate of northwestern Europe.

When he spoke of hybridizing, he gave the highest praise to his brother, D. T. Poulsen, whom he considers paramount for his originations of the first hybrid polyantha, 'Rödhätte,' in 1912. Out of this variety came the Poulsen hybrid polyanthas; 'Ellen Poulsen' and her sisters were introduced to the public at the National Rose Society in London in 1924.

Svend Poulsen's own best hybrid polyanthas (a term which he prefers to floribundas) include: 'Poulsen's Copper,' 'Poulsen's Delight,' Poulsen's Pink,' 'Poulsen's Bedder,' 'Poulsen's Yellow,' and 'Irene of Denmark;' also, in the last few years, the outstanding 'Sun Dance' and 'Tivoli.' He has also originated a large number of hybrid teas and park or shrub roses. A specimen of his recent 'Poulsen's Park Rose' is now growing in my own garden.

However, his greatest interest is in propagating hardy, disease-proof and proliferous hybrid polyanthas, for he told me that in the Scandinavian countries, over seventy-five percent of the sales are of roses in this class. In modern hybridizing, he criticized the use of miscellaneous strains, and he asserted that rose genealogies are often wrong, and methods of crossing are haphazard. He thought that constant breeding back from floribundas to hybrid teas destroys the quality of polyantha origin that is most worth developing.

Like other famous hybridizers, Mr. Poulsen spoke of the great expense, the hard work over a long period, of large-scale hybridizing, the raising, care, and selection of seedlings, as the odds are several thousand to one against discovering a successful new rose. Like Wilhelm Kordes, he feels that it is the problem of the state or of private philanthropy to esablish institutions for the study of cytology and genetics as applied to plant hybridizing and culture, one example of which is the John Innes Horticultural Institution in Hertfordshire, England.

Svend Poulsen's book on roses, long famous in Denmark, is a large, fully illustrated, imposing book. Recently it has been translated and published in English in a much smaller form. Every rose lover should read it.

But we must be on our way. At Paris, in June, 1955, we met Svend Poulsen's son, Nils, and his cousin, Sorendsen, manager of the Poulsen firm, at the Rose Concours at Bagatelle. I had long conversations with them, running the gamut of the origination, propagation, and commercial exploitation of garden roses.

The rose garden at Bagatelle, on the edge of the Bois de Boulogne, was exquisitely cared for and "dressed" for the International Rose Concours of 1955. But the season was backward, and the weather bleak and rainy. We met the judges and rose nursery men, both at the rose garden and at the well "wined and victualled" luncheon given by the municipality of Paris at the Eiffel Tower. Besides young Poulsen and Sorendsen from Denmark there were present: from France, Francis Meilland, Richardier, André Le Roy, Gaujard, Henri Nonin, André Vilmorin, and French officials and rose experts; from England, Harry Wheatcroft and Bertram Park, one of the judges; from Northern Ireland, Sam McGredy; from the United States, Sidney Hutton and Eugene Boerner; and other rose experts from Holland, Belgium, and even Japan. Spirited discussions took place as to hybridizing and merchandising and the tendencies which mark the new originations.

A few days later, at Geneva, we met many of these rose men again. Other representatives attended that concours, from Holland, Western Germany, Spain and Portugal. Here the roses, both in the trial grounds and in the LaGrange Park rosery, were much more proliferous than at Bagatelle. LaGrange Park, on the lakeside, in its expanse and symmetry, with its vigorous plants and freedom from disease, rivals the astounding rose garden in the Retiro Park at Madrid, as we saw it in 1950.

In Western Germany, we visited the rose park at Baden-Baden with Wilhelm Kordes, a huge Baroque formal garden of magnificent space and distances. Since the war, it has been completely replanted with roses. The trial grounds are separate, on a sunny hillside covered with the newest cinnabarred hybrid teas and floribundas of Kordes and Tantau, and equally startling new colors from many other countries.

On our way north, we saw at Kassel, in Hesse, the Bundesgarten, a square-mile park of horticultural demonstrations. The rose garden there glorifies a long hillside. Interplanted among the roses are perennials, dwarf heath-

ers, and even herbs. The rose show, in the reconstructed orangerie, contained thousands of blooms chiefly from the nurseries of Hesse and Steinfurth, arranged with imagination and originality. The screens of split bamboo, the pastel shades of the draperies, the spacing of alcoves and low platforms, the sunlight streaming through the great glass sides of the halls, gave effects of color and design like the paintings of impressionists. There were many of our American hybrid teas and floribundas, and many unfamiliar European ones.

A highlight at Kassel was a meeting of the German Friends of the Rose, at which the young landscape architect, who designed the rose gardens at both Kassel and Hamburg, spoke; and Herr Kordes showed his own color slides of rose trial grounds from England to Italy.

Our climax came at Planten und Blömen, the park at Hamburg so enthusiastically recommended to us by Herr Kordes. The succession of white-walled alcoves, the artificial mounds and hills, the modern summer-houses, meandering walks and waterways, the profusion and variety of bloom, the sophisticated edging and interplanting of perennials and low-growing plants—all are the accomplishment of exceptional gardening and landscape design.

At Hamburg, Wilhelm Kordes called for us at our hotel and took us to his nurseries and greenhouses at Sparrieshoop near Elmshorn in Holstein, then on to the naturalistic and very lovely rose park at Uetersen, which he established with his friend, Matthias Tantau. There an ancient thirteenth-century mill-race has been converted into a lake. Kordes planted this park in the English manner, with a full collection of roses of their own origination, plus most of the well-known foreign varieties. Kordes' hybrids here include his very successful park or shrub roses; these he developed out of the musk hybrid 'Eva' and others of the musk strain. We saw also his recent spinossissima and rubiginosa hybrids. He pointed to *R. magnifica* and spoke feelingly about its contribution to this experiment. Our English, French and German friends call him the greatest rose expert and hybridizer of our age. This was publicly acknowledged on his recent sixty-fifth birthday, when President Adenauer gave him an official decoration. In 1956 he published an important new book on roses.

Wilhelm Kordes and his brother Herman, sons of the founder of the nurseries, compose the firm of Wilhelm Kordes Söhne. In their encyclopedic catalog, they advertise five hundred and sixty-six varieties of roses; theirs, they state, are the largest rose nurseries in Europe. Herman Kordes has originated several excellent garden roses, but Wilhelm has a total of over two hundred successful hybrids. His hybrid teas, from 'Heinrich Gaede' and 'Crimson Glory' to 'Karl Herbst' and 'Cleopatra,' and his floribundas from 'Rosenelfe' and 'Holstein' to 'Sondermeldung' ('Independence') and 'Feuermeer' ('Sea of Fire'), and his many successful hybrids out of the musk, macrantha, spinossissima, sweetbrier, rugosa and other species, entitle him, indeed, to the most distinguished place among living rose men.

Wilhelm Kordes holding one of his own new hybrid tea roses 'Cleopatra' and Swim's 'Montezuma'

He is a tall, impressive figure, with keen blue eyes, white hair brushed straight back, and a square Hans Sachs beard. There is something of the legendary Gothic hero about this champion of the rose. He is a successful nursery man, an expert hybridizer of long experience, and a systematic student of the science of cytology, studying at nearby Kiel University. His manifold activities include discussions with horticulturists from many parts of the world, and many papers and articles. His dedication to the rose is qualified only by the length of his working day.

Whatever national preferences and prejudices rose men have, they do not assert them against roses of foreign origin. Kordes, who lived in England for a long period, speaks English fluently. In talks with us, he was equally enthusiastic over Danish, Dutch, English, French, American, and German roses. For a color photograph which Mrs. Bechtel took of him, he insisted on holding, with his own new 'Cleopatra,' the Armstrong grandiflora rose 'Montezuma.'

The entrance plaza at Bundesgarten, at Tassel, in Hesse

The jury in the trial grounds at Parc de la Grange, Geneva, Switzerland

He spoke of the understocks used in different countries, and said that he thought adaptation to climate and soil was the best test, but that inherently *R. multiflora* was probably the best understock for floribundas. He conjectured that the reason why some of the American floribundas had developed rust abroad was traceable to their *R. canina* understocks

We saw many of his new seedlings and fields of his "maidens" soon to be ready for his fall customers. He described his new floribunda 'Ama' as "Rubens red-orange," and 'Korona' as "orange-scarlet-red, of a beauty of color and profuseness of bloom before unknown." He called special attention to his new continuous-blooming climbers 'Hamburger Phoenix' and 'Leverhusen,' also 'Flammentanz,' which outrivals 'Paul's Scarlet.' Many of these we saw doing very well at the trial grounds of the National Rose Society at Oaklands. And Americans are beginning to know his superlative shrub roses, out of his *R. spinosissima* hybrids, such as 'Frühlingsgold' and 'Frulingsmorgen.'

Shortly before the Louisville meeting of the American Rose Society last fall, I received this letter from Herr Kordes:

"Dear Mr. Bechtel: Thank you very much for your kind letter, and your congratulations on the decoration given me on my 65th birthday. After all, it's a sign of me getting old! Still I'm very much interested in continuing my life's work in breeding roses, and still hoping for some unusual results. This summer I flowered a very dark violet centifolia, I know no other amongst the old gallicas and centifolias with such very even and deep color. It will be for 1958; maybe in its children we shall get even hybrid teas or floribundas in this rich coloring.

"Next year I hope to flower the first Kordesii-moss-hybrids. That moss rose has always been a tricky thing, and yet some of my seedlings are fine and mossy.

"Please express my heartiest greetings to members of the American Rose Society, at the Louisville meeting. All I can wish is that they all may have again more beautiful roses next summer and for many more years to come.

"'*Nos jungent rosae*' (may roses unite us) was the slogan of the bygone rose society of the Netherlands. It ought to be the slogan of us all.

"With kindest regards and best wishes, Sincerely yours, Wilhelm Kordes."

Sparrieshoop, Aug. 21, 1956.

The head gardener in the test garden, the rosery at Bagatelle, Paris

BUSMAN'S HOLIDAY (from page 38)

issue of The Garden Journal). However, we took advantage of our stay to visit the Jardin des Plantes, the Vilmorin-Andreux Nursery at Verrieres-le-Buisson, the Louvre, the cathedral at Rheims, and to enjoy in the lovely evening hours the sidewalk restaurants where Madame and Monsieur les proprietaires took such a personal interest in our enjoyment of their culinary accomplishments.

Mrs. Robbins and I had lunch with Prof. Roger Heim at the Cochon au Lait restaurant and enjoyed suckling pig roasted on a spit before an open fire after which I attended, with Professor Heim, a meeting of the French Academy of Science. It was my privilege to meet several members of this Academy, including the President and also Dr. Gabriel Bertrand, whose investigations on the importance of zinc, manganese, and other minor mineral elements for plant growth attracted my attention when I was a graduate student forty-

five years ago. These investigations eventually led to important practical applications.

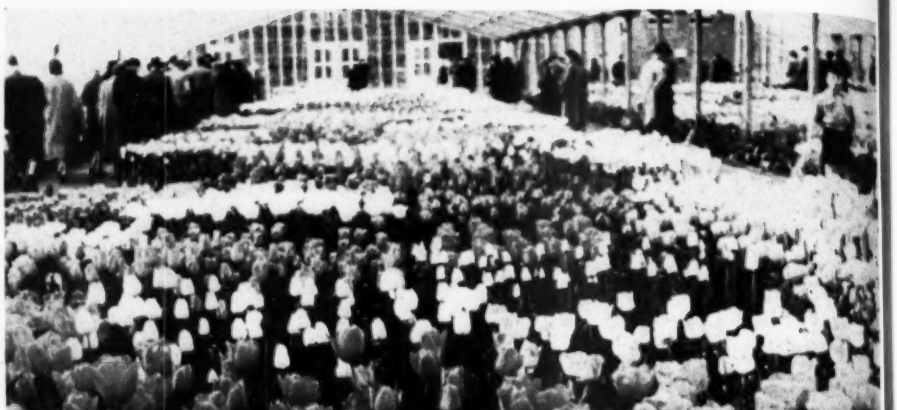
Dinner at the home of Prof. Pierre Chouard gave us an opportunity to visit with his wife and with Dr. Philibert Guinier, honorary director of the Forestry School, Professor Henri Gaussen of Toulouse, and Professor and Mrs. Jacques Rousseau of the Montreal Botanical Garden. I also inspected, with Professor Chouard and Dr. Guy Camus, the new research center under development outside Paris.

It was a great satisfaction to see once more the vistas of the Jardin des Plantes, the allées of sycamores and the historic trees, for example, *Quercus macrocarpa* introduced by Michaux in 1811, the first *Sophora japonica* planted in France in 1747, *Robinia Pseudo-Acacia* planted in 1601, and others.

Our tour to Rheims by bus filled by French people on holiday was an experience. We passed extensive vineyards, visited the champagne cellars of Moet et Chandon Maison, stopped at various historic sites, and arrived at the cathedral with sun shining through the rose windows. It was not easy to break away from our seats in the cathedral from which we could watch the play of light on the stained glass.

My visit to Gif-sur-Yvette with Professor Chouard was far too brief. I had, however, the opportunity of inspecting the partially constructed impressive phytotron and laboratories for the study of photosynthesis and learned of the additional development contemplated for the lovely estate where these laboratories, as well as others, will be located.

It was with some reluctance that we took a plane for New York on September 15. There were so many places we had not been able to see, so much we had left undone. At the same time, we were eager to return to The New York Botanical Garden. I had collected a fund of information on propagation which I was anxious to collate and apply; Mrs. Robbins had some ideas on Dutch furnishings. We came back encouraged by the new developments in horticulture and botany and by the high spirit with which important problems were being attacked. Last but not least, were our recollections of the friendly hospitality of our colleagues and the inspiration their efforts gave us.



Tulips in the glasshouse at the Keukenhof bulb garden near Lisse, Holland

A GARDEN OF TEN MILLION BULBS

By Murray Wright

IT IS TULIP TIME in Holland and in the great bulb-growing district between the Hague and Haarlem thousands of acres of tulips present squares and oblongs of dazzling color like a huge patch-work quilt. Right at the heart of this immense display near Lisse is the famous bulb garden known as the Keukenhof. This is no ordinary garden; it is a grand exhibition of bulbous plants flowering in season and comprising a collection of species and varieties unsurpassed anywhere else in the world.

The Keukenhof extends to about one hundred acres and consists basically of semi-woodland interspersed with canals, pools of water, and an artistically designed lake at one end. Thus ready-made there is shelter and a superb natural setting for the flowers. A great many bulbs are planted beneath the trees, and the open glades are used for massed effects with beds of hyacinths, narcissi and tulips. Everywhere the blossoms, leaves, turf and bright sheets of water seem to mingle and form a harmonious picture.

Tulips lend themselves to spectacular displays of color, but in the Keukenhof the effect is greatly enhanced by the enormous numbers in which they are grown. Indeed they are planted by the million, and the total number of varieties is about six thousand.

All the important classes of tulips are well represented such as the tall Darwins, the bronze-colored Breeders, and the fantastic-looking Parrots. There are also graceful Cottage tulips and strong-growing Triumphs. The colors are almost indescribable and range from blooms as white as snow to as nearly black as it is possible for any flower to be. Several tulip species will be found in the garden. The two most popular are *T. Kaufmanniana* and *T. Fosteriana*.

At the Keukenhof the brilliant exhibit of tulips is preceded by the softer tones of narcissi, also in massed array and in tremendous variety. They are equally effective. All the best varieties in existence are to be found there and nowhere can one get a better impression of the patient work of the hybridizer in gradually transforming the flowers of this genus. One is particularly struck by the steadily increasing range of brighter colors, such as orange, red, and pink.

Hyacinths, of course, are another specialty of the Dutch, and their skill in the propagation and culture of these

bulbs is world renowned. It is interesting to note that it takes three to five years to produce a flowering bulb. Not so long ago hyacinths were available only in distinct colors of red, white and blue; but due to the energy of the hybridizer, today there are innumerable intermediate tones of these basic colors including pastels.

Hyacinths are the first bulbs to flower in quantity in the garden. Again their large numbers emphasize their beauty of color and form. Another striking feature is their wonderful perfume which is something the visitor will long remember.

The very large glasshouse in the Keukenhof is used mainly for the cultivation of tulips. There, in late March or early April, the choicest varieties are blooming en masse to provide one of the showiest displays it is possible to imagine. Indeed, this feature alone justifies a visit to the garden.

In case the amateur gardener visiting the Keukenhof might imagine that bulbs are effective in huge beds only, there are six model gardens to show how excellent results may be achieved with quite small quantities. Each garden has an area of about four hundred square yards which is somewhat longer than an average allotment. These little gardens have a pleasing outline and are attractively designed. Various bulbs are planted to secure a succession of bloom as long as possible.

A few rock gardens in the Keukenhof blend most effectively with the woodland and adjacent pools of water. Moreover, a rock garden is the ideal position for the smaller bulbous plants such as *Narcissus bulbocodium, N. triandrus, Iris reticulata* as well as *Chionodoxa, Cyclamen*, and dwarf anemones.

As most of the ten million bulbs in the garden are lifted and replanted annually, the Keukenhof presents a new appearance every year. Adding also to the charm of the garden, sculptures, the work of modern Dutch artists, are set at vantage points, perhaps as the central feature of an arrangement of flower beds or at the end of a pleasant vista.

The beauty of the Keukenhof appeals to all, and it is really designed and kept in being to advertise one of Holland's most important products, namely bulbs. It is virtually a huge "shop window" for the Dutch bulb industry. Its effectiveness in this direction can best be gauged by the fact that more than half a million people pass through the garden's turnstiles annually, and they come from many different countries. This figure is even more impressive when it is realized that the garden in its present form came into being as recently as 1950.

The name Keukenhof apparently means kitchen garden in Dutch, for the site of this beautiful woodland of bulbs was once the kitchen garden of a large estate known as Teylingen Castle. But in spite of a commonplace name, the history of the garden and its environs, we are told, have many romantic associations. Today it is quite unique among gardens and is likely to remain a permanent and delightful memorial to those who created it. Every gardener who visits Holland should see the Keukenhof.

A pool and rock garden with daffodils and other bulbs at the Keukenhof bulb garden

1956 "International Tulip Selections" are included in the extensive outdoor planting of tulips, which will be seen this spring on the hill near the new Laboratory-Research Building of The New York Botanical Garden. These six tulips, chosen as favorites by a poll taken during the bulb show in the Keukenhof Garden last year, are: 'Red Matador'—Triumph; 'Smiling Queen' — Cottage; 'White Triumphater' — lily-flowered; 'Queen of the Night'—Darwin; 'Holland's Glory'—one of the new Darwin hybrids; and 'Blue Parrot'—Parrot. Many other outstanding tulips will, of course, be included in the display—and all will be labelled to enable visitors to select varieties for their own gardens.
The Editor

MULCHES and FERTILIZERS for RHODODENDRONS

By Warren Baldsiefen

A DECADE AND A HALF of experience and careful consideration have taught me that for the most beneficial all-around mulch we must turn to the conifers. Both plantations and those indigenous to almost any region provide a variety of species from which to choose. Because of their abundance in our section, red and eastern white pines are utilized the most, although Jack, pitch, Virginia, Austrian, and Scotch pines have been used with equal success. Offhand, I can think of no region where rhododendrons are grown that conifers will not also survive, and any reasonable effort expended in gathering needles will be well worth the time.

The needles of red pine *(Pinus resinosa)*, being coarser and somewhat larger, tend to resist decomposition longer. I use these on larger plants. The soft delicate texture of white pine *(Pinus Strobus)* needles makes them extremely well suited for mulching either small alpines or one-or two-year-old, large-leaved sorts where the mulch,

(Continued on page 56)

GARDENING WITH

POTTED PLANTS

By Kathryn S. Taylor

THE CULTURE OF PLANTS in pots is usually associated, in a gardener's mind, with the technique of gardening in a greenhouse, sun-heated pit or plant window. While this supposition is generally correct, there are situations where it is more feasible to grow the plants in pots than to set them into the outside garden. When plants are in pots, the gardener has almost complete control of the conditions under which they are grown. This is a special advantage when the garden soil is not fertile, when the water supply is limited, when too many rabbits and woodchucks abound, or when an insect infestation is so bad that only plants isolated from the garden proper can be kept free from them. Areas too shady for most garden plants can be made wonderfully attractive with appropriate material grown in pots. Any garden terrace is enhanced by potted plants as part of the design, and this form of gardening is particularly suited to modern houses whose immediate surroundings often cry out for plants used in this way. Pots of oleander, hibiscus, agapanthus, geranium, lantana, *Plumbago* and *Tibouchina* on sunny terraces and of fuchsia, tuberous begonia, achimenes, and *Impatiens* on more shaded ones can provide much color and interest during the summer months, especially when the regular garden may have proved a disappointment.

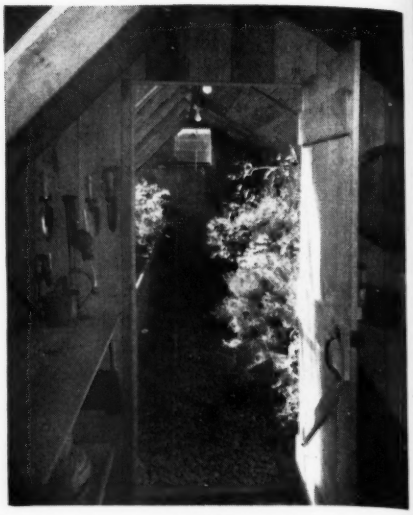
When gardening with potted plants, the gardener must realize that few of them bloom continuously both summer and winter and that it is essential that a congenial resting place for them be planned for. For plants that rest in the winter the place should be cool, airy, and light but not too sunny. Unheated attic rooms, sun porches protected from freezing, pits, and cellar areaways can, with a little ingenuity, be turned into satsifactory winter homes for many plants. Light frames of vinyl or polyethylene plastic can be made at home and used in many ways to furnish insulation which will hold the temperature above freezing.

For plants that bloom in the winter, like camellias and azaleas, light shade must be provided during the summer months. A lath house, preferably of material like "Alumilath," is ideal for this purpose. Many garden terraces that become too hot and sunny in midsummer would be much more useful with a covering of "Alumilath" easily removable when the hot weather has past. Both plants and people would appreciate such an arrangemeint. So many modern materials are now available to the home gardener that he has a fine opportunity to increase the scope of his gardening, even if a conventional greenhouse is not at hand.

The important point to remember is not to start any type of pot gardening without all of the essentials necessary to carry the project through successfully. For example, enthusiastic amateur gardeners often start seeds indoors during the late winter without looking forward to what is to be done with the little plants when it is time to prick them off. Seedlings that have spent several weeks in a hot, dry, poorly lighted window are not healthy enough to do well in the garden when the weather is favorable for setting them out. Any deficiency in the requirements for growing plants along from seeds or cuttings to the mature state must be remedied. If this fact is realized at the start, much failure and disillusionment can be avoided.

Few amateur gardeners have the facilities for growing plants that need cool conditions and more tropical species as well. Many plants prefer a night temperature of 55° F. to 60° F. This is particularly true when many annuals are grown. A goodly number, also, do best at 50° at night, or even lower. One advantage of specializing in plants that like to be kept cool is the great saving in both time and expense in caring for them in winter. The very busy amateur with many outside commitments who likes to do his own gardening would do well to stick to plants of this sort.

Much can be learned by visiting a well-run private greenhouse. Almost invariably, beside the greenhouse itself, there will be a deep cold pit for plants taking their winter rest, a good range of coldframes, and a lath house of some sort to shade resting plants in summer. All are indispensable at certain times of the year, and the gardener without such adequate equipment must curtail his program proportionately. Owners of large greenhouses sometimes assert that it is impossible to grow good plants in small houses. Nevertheless, it is surprising what the owner of a tiny greenhouse can accomplish if other necessary adjuncts are at hand.



The pit house on the home grounds of Mrs. Augustin H. Parker, Jr., at Sherborn, Massachusetts, has a full-height entrance

Even with a minimum of equipment much can be done. Chrysanthemums are favorites with every gardener. Just as in the outside garden, they need ample light and air at all times. Good results are obtained by growing the plants in pots plunged outdoors in the nursery row or vegetable garden. It is not even necessary to have a greenhouse to which to transfer them when danger of frost is imminent. One good gardener erects frames of plastic material around the pots right in the garden. These should be tall enough to stand well above the tops of the plants. On cold nights a cloth is thrown across the tops of the frames, and several old-fashioned lanterns are hung underneath to keep the temperature above freezing. She takes a succession of pots into the house over a period of several weeks, and the flowers beautify her home up to Thanksgiving.

The Dutch bulbs are too well known to describe here, but many flower lovers still fail to experience the pleasure of

The author's greenhouse is filled with potted plants

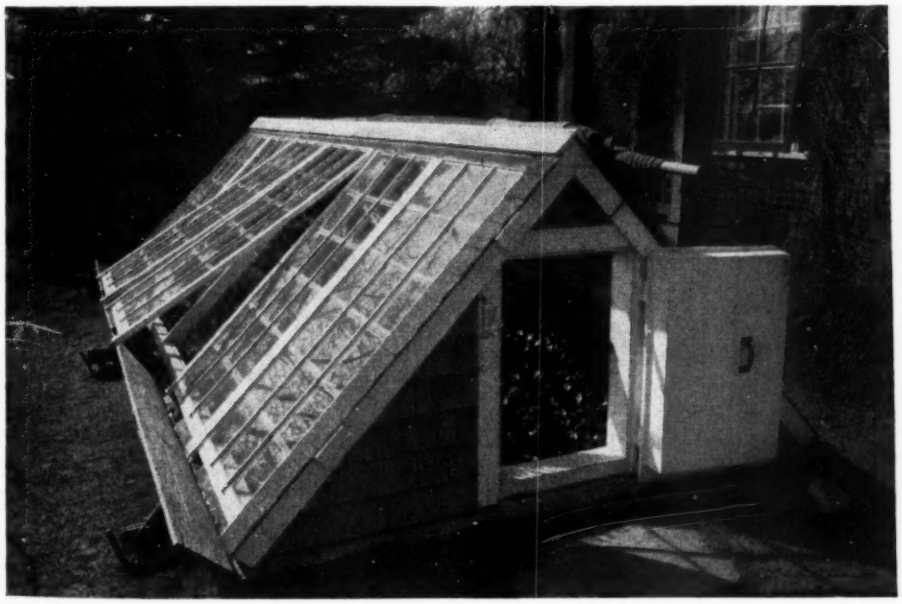
forcing them at home. The species crocus are forced with the greatest of ease and start to flower in midwinter. A plant box placed on a sun porch that seldom falls below freezing and can be kept cool during the day could be a surprising source of interest and experiment with bulbs and woody plants. Plants that normally flower outdoors during the winter months in climates somewhat warmer than ours would be the ones to try.

Outstanding among such plants are the species cyclamen which fascinate all who see them. The best known species is *C. neapolitanum* which is fairly hardy outdoors and blooms in October and November. Of greater interest, however, are species which naturally bloom during our actual winter and which, even if they were hardy, would therefore be of little use for our gardens. Grown in pots plunged in ashes or peat, so that they are not frequently dried out by sun and wind, *C. cilicicum, C. libanoticum, C. Atkinsii, C. repandum, C. coum* and, doubtless, various others can maintain the flowering season right through the winter. Woody plants that blossom in midwinter in a cool atmosphere include camellias, *Daphne odora,* sweet olive, rosemary, and Australian fuchsia *(Correa)*. Although a commonplace plant, the naked jasmine, *Jasminum nudiflorum,* trained on a trellis, is sure to flower in January and could hardly be easier to grow. In the garden the flower buds are often blasted when a very cold spell occurs. Pots of boxwood or of any of the hollies, in or out of fruit, add a rich green to the winter garden held close to freezing. Primulas, especially *P. malacoides*, are ideal herbaceous plants for cool conditions. Violet 'Royal Robe' produces fragrant flowers in December and January.

An unexcelled place for bringing on plants of this kind is the sun-heated pit which, unlike the customary, dimly-lighted, deep storage pits used by professionals is filled with sunlight during the daylight hours. The average night temperature for such a structure is 40° F., and ample ventilation during the day will hold the temperature below 70° F. A ventilating fan installed in one end of the pit will draw out any stagnant air which may accumulate, since much of the pit is below ground level. There is no room in this article to give detailed information about sun-heated pits, but there is no doubt that the pit gives more satisfaction for a limited amount of attention and upkeep than any other type of winter garden. Sun-heated pits are frequently used to furnish a constant supply of potted plants for plant windows in the dwelling house. One, which is equipped with a small electric heater with a fan, has a thermostat set at 40° F. It produces the healthiest camellia plants, azaleas, Dutch bulbs, *Primula malacoides,* winter-flowering forget-me-nots, and similar material that anyone could ask for, all with slight attention from the amateur who grows them.

The average temperature preferred by potted plants is very important and greatly affects their growth and flowering ability. The winter-flowering genera so far mentioned require only to be a little above freezing. Some spring and summer bloomers such as azaleas, fuchsias, and geraniums, especially the Martha Washington geraniums, can spend

(Continued on page 53)



The exterior view of the sun-heated pit house at the author's home in Dover, Massachusetts

Miniature Roses

By Margaret Pinney

Continued from January-February issue

PINK CAMEO. "Climbing H.C.M." Pat. 1451. The status of this little climber is still in doubt. The Registration Committee of the American Rose Society stated that "Moore's registration of Pink Cameo (registered as 'climbing hybrid *chinensis minima*') is a contradiction of terms" (the American Rose Magazine, November 1954, p. 15). If this classification is unpleasing to the Committee, a new one will have to be found for the growing number of these roses — Dot's 'Climbing Perla Rosa,' Moore's 'Fairy Princess,' 'Papoose,' 'Red Head' and 'Zee,' and Hilling's 'Climbing Pompon de Paris.' 'Pink Cameo' has a thin, thorny stem and glistening dark leaves. Its breeder claims that it will grow to five feet as a shrub and three feet as a pillar. With me it remains dwarf and dainty and shows its *R. chinensis minima* ancestry plainly. The bud is tyrian rose. The slightly paler, one-inch flower is cupped and looks very much like the flower of 'Cameo,' though it is not related. The parents are 'Soeur Thérèse' x 'Wilhelm' X 'Zee.' It was brought out in 1954.

PINK JOY H.C.M. Pat. 1378. This minute bush, three to six inches high, has quality and character to an unusual degree. The flower is one and a quarter inches wide, but somehow does not seem too big for balance. It is of two shades of bright pink, with some of the center petals yellow. It has about eighty petals and opens almost flat. The bud is beautifully shaped, deep pink with a hint of salmon. The pale green, soft foliage is thornless. 'Pink Joy,' a seedling of 'Oakington Ruby,' was brought out in 1954 by Sequoia Nursery.

PIXIE H.C.M. Pat. 408. This is one of the true reliables among dwarf roses and is to be bought at a large percentage of nurseries. It grows five to nine inches high, has abundant soft pale leaves and few thorns. The numerous white flowers are one-half to three-quarters of an inch wide, developing a pink tinge in cool weather. Bermuda Nurseries describes it as white with pale pink center, but I do not find it so. There is a very slight fragrance to reward a persistent nose. Mr. de Vink bred this treasure from 'Ellen Poulsen' and that tiny but prolific father, 'Tom Thumb;' Conard-Pyle introduced it into the United States in 1940. It is said to be the same as the "Little Princess' of England and 'Princesita' of Europe.

PIXIE PEARL H.C.M. This is very like 'Estrellita,' though it does not have the red tints of the latter. It grows six to twelve inches tall, has thick stems, and profuse clustered white flowers. The flowers are very double, with fifty to eighty petals; the fat bud is creamy white; the leaves are pale green. 'Pixie Pearl' was grown by Lamb Nurseries from seed and introduced about twenty years ago.

POLKA DOT H.C.M. Pat. Rights Res. Called by its breeder a miniature 'Kaiserin Augusta Viktoria,' this rose grows to six inches, is nicely shaped, and has thick blue-green foliage. The color of the flower is a beautiful ivory-white; the petals (about eighty) are wide with sharp pointed tips. The bud is creamy yellow. There are many translucent pink thorns. Its parents and breeding are the same as those of 'Jackie,' which it somewhat resembles.

POLLY FLINDERS H.C.M. This has the most startling color of all the miniatures. The one-inch flowers are cream-colored with varying amounts of brilliant coppery orange in them. Occasionally, the whole flower is one color or the other. The number of petals varies from twenty to forty. The flower opens wide to show a pink central boss. 'Polly Flinders' grows four to eight inches high, has large dark red-veined leaves, and long soft thorns. It is sold by the Porchester Nurseries of Nottingham, England, which gives its origin as 'Little Princess' X 'Fashion.'

POMPON ANCIEN. See 'Pompon de Paris.'

POMPON DE PARIS H.C.M. It grows three to eight inches high, has dark green tiny leaves, and few thorns. The bud is deep pink or red; the flower, a bright rose-pink, sometimes deepening to light red, has ten to fifteen petals. There is no scent. Introduced in 1831, its origin is unknown.

There is some difference of opinion about this rose. W. and G. Stout in American Rose Annual 1941, p. 27, state that "'Pompon de Paris' is not truly a fairy rose, for its growth is too large." Yet they include 'Baby Gold Star' which in my gardens has always been twice the size of 'Pompon de Paris.' In Flower Grower 1950, p. 52, Roy Shepherd says that he is convinced that the flower we know now as 'Pompon de Paris' is the same rose as the 'Pompon de Paris' of 1831; Modern Roses IV, p. 210, calls it "Very small, dbl., bright pink. Plant smaller, bud more pointed, fl. more dbl. and deeper pink than Roulettii." To this I agree, and add that the leaves are smaller and daintier than those of the plant we know as *R. Roulettii.* It is sometimes called 'Pompon Ancien.'

CLIMBING POMPON DE PARIS H.C.M. This climber is advertised in the catalogue of Hilling and Son of Winchester, England, but has not reached my garden yet. It is said to be like its namesake, except that it is non-remontant and the color of the flower is "old blush."

POUR TOI. See 'Para Ti.'

PRINCE CHARMING H.C.M. This delightful rose, which grows eight to twelve inches tall, has blue-green foliage tinged with red. It has a number of medium-sized pink thorns. The flowers, one inch wide, are a bright crimson and are shaped like a five-pointed star. The thirty-five petals fold back to show a tiny upstanding clump of stamens in the middle. No fragrance is discernible. Its background is 'Ellen Poulson ' X 'Peon.'

PRINCESITA See 'Pixie.'

PUMILA H.C.M. An individual with a mind of its own, not to be influenced by gifts of manure or a fancy mulch. I have never been able to understand its caprices. It always looks healthy. Sometimes it blooms its head off all summer, sometimes it grudgingly produces three flowers in June.

It grows eight to eleven inches with blue-green, deeply serrated leaves and a few thorns. The flowers are usually bright pink, but often red or spotty red and pink. At one time they have fifteen petals, at others a hundred. The buds are long, pointed, and deep red. 'Pumila' is an attractive dwarf, and I do not mean to "damn it with faint praise."

QUEEN OF THE DWARFS H.C.M. This is a large vigorous plant growing about ten inches high, with rather coarse, medium green, red-veined leaves. The bud is big and round, light crimson, with long leafy sepals. The long-stemmed flower, borne singly, is a perfect 'American Beauty' in miniature. Although it has only about fifty petals they are so wide that they hide the stamens even when opened flat. 'Queen of the Dwarfs' came from the Bermuda Rose Nursery; it was originated by Kordes in 1955.

RED ELF H.C.M. Pat. 973. The minute plant rarely grows higher than two to five inches, but spreads comfortably sideways. The dark crimson buds and half-inch flowers, which grow in clusters, show a white base. The flowers vary somewhat as to the number of petals, but usually have about twenty to twenty-five. The tiny leaves are dark green and soft with red edges. Hardly any fragrance or thorns. Originated by De Vink—its parents are 'Eblouissant' X 'Tom Thumb'—'Red Elf' was introduced in 1949 by Conard-Pyle. The consensus of opinion in American Rose Annual 1954, Proof of the Pudding, p. 241, is that it is a miff. This is often true; but when 'Red Elf' is happy, there is nothing more attractive.

REDHEAD Type of Cl. Cameo. Pat. Rights Res. This 1956 creation of the Sequoia Nurseries is both interesting and attractive. It grows about eight inches high and spreads sideways over a trellis. The stems are rather heavy, the leaves dark green, and not of *chinensis minima* type. The bud is red; the two-inch flower a lovely crimson with white center. The twenty-five petals open flat to show a large number of bright yellow stamens. Thorns, a few; fragrance, none. The parents are 'Soeur Thérèse' x 'Wilhelm' X Seedling 'Red Ripples' X 'Zee.'

RED IMP H.C.M. Pat. 1032. An upright, bushy little plant, two to six inches high, 'Red Imp' has medium green leaves and slender stems. The dark red bud is ovoid; the deep crimson flower with white base is double, forty-five to sixty petals, and fades very little. It is a compact flower, one inch wide, and opens flat. It has a very slight fragrance and few thorns. Bred by de Vink from 'Ellen Poulsen' and 'Tom Thumb,' Conard-Pyle brought it to the United States in 1951. It is called 'Mon Tresor' in France and 'Maid Marion' in England. 'Imp' and 'Hillier's Imp' are probably the same plant.

RED RIDING HOOD H.C.M. It grows from five to ten inches high, has dark green leaves and leaf-back thorns. The buds of black-crimson have long, leafy sepals. The double, three-quarter-inch flowers are of a brilliant dark velvety red and grow in clusters. 'Red Riding Hood' came from Thomas Robinson's Porchester Nurseries, and is a sport from 'Maid Marion.'

ROBIN H.C.M. In Spring 1957 there will be a new miniature from the Conard-Pyle Nurseries. 'Robin' grows about twelve inches tall, and the color is a rich, deep red.

ROSA CENTIFOLIA POMPONIA. A dwarf, but apparently not a *chinensis minima,* this has a bright red double flower, one and a half inches wide. (Modern Roses IV, p. 262.)

ROSA CHINENSIS MINIMA FAIRY ROSE. This is supposed to be the prototype from which all of our little hybrids spring. The height of the plant is one foot; the single or double flower is rose-red. An English friend described to me roses imported by his mother from China in his childhood and grown in her garden in Darjeeling. They were called "dwarf Chinas," were up to one foot tall, double, pale pink and ever-blooming, with tiny delicate flowers and leaves. He cannot remember any scent. They were not *R. Roulettii.* According to Modern Roses

'Pink Cameo' from Sequoia Nursery, Visalia, California in 1954, is a dwarf and dainty plant in the author's garden. Here its rose-colored blooms have been used in a pleasing arrangement.

IV, p. 263, this rose is also called *R. semperflorens minima, R. Laurentiae, R. Lawrenciana, R. indica pumila,* and *R. Roulettii.*

ROSADA H.C.M. I have not seen this rose, but a picture I have of it shows it to be a good deal like *R. Roulettii* in foliage, color, shape, and size of flowers. It is described as being "clear peach to neyron pink at edges" and "very compact (seven to eight inches), profuse, continuous bloom" (Modern Roses IV, p. 284). It is double, with twenty-five petals. It was bred by Pedro Dot from 'Perla de Alcanada' X *R. Roulettii* and was an International Rose Selection in 1950.

ROSINA H.C.M. This is said to be dwarf and compact, but the usual height is about six to ten inches, and I have known it to be even taller. With me it is rather rangy, with heavy stems and strong, large blue-green leaves. In spite of all this, it is delightful with bright butter-yellow flowers of fifteen to twenty petals, and pointed, long-stemmed buds. The outside petals are broad oval; the center ones, long and strap-like, curl over the prolific brown stamens. It is a steady bloomer and has a faint fragrance. It was bred by Pedro Dot from 'Eduardo Toda' and *R. Roulettii* in 1942. 'Rosina', Universal Rose Selection in 1951, is called 'Josephine Wheatcroft' in England.

ROULETTII H.C.M. This little rose is supposed to be the ancestress of almost all of our chinensis minimas. It was discovered growing in a pot on a Swiss window sill by Major Roulet at the beginning of the century. It was introduced to the world by Correvon about 1922. There are many conjectures as to its origin, but it is supposed to be one of the dozens of hybrids of the original little China roses introduced into Europe at the beginning of the nineteenth century. It grows three to ten inches in height and has tiny, inch-wide, double, shaded pink flowers of thirty to fifty petals. It is capable of a good deal of variation in size, color, and doubleness of its flowers. One of my bushes in one season produced flowers two inches wide of a bright rosy pink, and later small lavender-pink ones not half that width and of twice as many petals. It is very hardy and a good bloomer.

Ralph S. Moore of Sequoia Nursery, Visalia, California, examines the new miniature rose 'Mary Haywood'

SIMPLE SIMON H.C.M. This small, compact plant to ten inches tall blooms freely at two inches. The many one-inch flowers have twenty-five to thirty petals and are deep carmine, fading somewhat in strong sunlight; they have no fragrance. The round buds are an exquisite deep pink, with long sepals. It has bluish, fern-like small leaves, a few soft thorns, and was originated by de Vink from *Rosa polyantha nana* x 'Mme. Pierre S. du Pont,' F2 X 'Tom Thumb.'

SNOWFLAKES H.C.M. A tiny but vigorous plant two to six inches in size; mine stays about two inches and blooms persistently through the hottest weather. The lovely little white flowers are borne in clusters of three or more, three-quarters of an inch wide, with twenty to fifty strap-like petals. The very small bud is rather mossy. The leaves are medium green and shining, with slender thornless, pink stems. This was bred by Sequoia Nursery and introduced in 1954; the parents are *R. Wichuraiana* x 'Floradora' X 'Zee.'

SNOW WHITE H.C.M. This rose grows in a low, spreading manner, three to eight inches high. The half-inch bud is long and pointed and a very pale pink. The clustered flowers are white with a slight flush, one inch wide and very double, with about a hundred petals. The pointed leaves are dark green and small with red veins. There are fierce large pink thorns. It was bred by T. Robinson, of Porchester Nurseries; from 'Little Princess' X 'Baby Bunting.'

SUNBEAM HCM. This rose, produced by Thomas Robinson in 1955, is very small with fragrant, deep yellow flowers.

'Tommy Tucker', a low shrubby rose with clear deep pink, slightly scented blooms, was bred by T. Robinson of Porchester Nurseries in Carleton, Nottingham, England

SWEET FAIRY H.C.M. Pat. 748. Next to 'Perla de Alcanada,' this is the most satisfactory of little roses. It is not one of the smallest, as it grows six to fourteen inches, but it is so dainty and well proportioned and has such delightful scent and bloom that there can be no complaints. The inch-wide, appleblossom-pink flowers have fifty to sixty-five pointed petals and are noticeably fragrant. The slender, deeply serrated leaves are small and dark blue-green. De Vink bred this treasure from 'Tom Thumb' and an unnamed seedling, and Conard-Pyle brought it out in the United States in 1946.

ENGLISH SWEET FAIRY. In 1950 I brought back a 'Sweet Fairy' from England, like ours in all respects except that it was only about two-thirds the size of the other.

SWEET VIVID. This plant seems to be the twin of 'Baby Lillian.' Mr. Lamb of Lamb Nurseries, who gave it to me, told me that its one great fault is that it "dies of mildew." Here in our drier climate it is usually free from that curse. It is said to have come from Rocknoll.

THUMBELINA H.C.M. It grows from four to eight inches high and is, according to its breeder, Ralph Moore of Sequoia, "an improved 'Tom Thumb'." It has more petals than 'Tom Thumb,' thirty to fifty. The color, according to the Spring Hill catalogue, is "bright cherry-red," but with me it is crimson. 'Thumbelina'

(Continued on page 52)

THE DOGWOOD BORER

By John C. Schread

THE FLOWERING DOGWOOD, *Cornus florida* L., occurs as a native low growing tree in the eastern half of the United States from Canada to Florida. It is included among the best of the flowering trees and is grown extensively as an ornamental in mass plantings and as a specimen plant; hence, the dogwood will do well in any usual soil where the alkalinity is not too high.

The attractive spring flowers and the reddish autumn foliage and fruit are, perhaps, the chief reasons for the accelerated demand for flowering dogwood trees in recent years. The pink variety is an offspring of the white and may be propagated by cuttings, grafting, and budding. It does not reproduce true to flower color from seed.

Flowering dogwood has few insect enemies. The worst of these is the dogwood borer, *Thamnosphecia scitula* Harris. The larval stage of the pest enters the tree through injuries of any nature to the bark. It feeds at first in the outer portion of the inner bark and later on in the cambium as well. Injury may go unnoticed until the swollen, knotty, gall-like areas appear. Seriously infested trees or girdled branches may die from their injuries.

Trees may be infested with borers on the trunk, at or just below the surface of the ground, or between the level of the soil and the branches above including the areas of union between the trunk and branches. Occasionally, the latter type of injury may be found farther out on the principal scaffold, where smaller branches and twigs have been injured at their union with the parent branch or broken off completely.

The borer is the feeding stage of a clear-wing moth. It has narrow transparent wings and is blue-black in color with some yellow markings. There is only one generation a year. The adults begin to emerge late in May, or about the time weigela begins to blossom, and continue to do so throughout the remainder of the spring and summer months, often to as late as the latter part of September. Adults are most abundant in late June and early July.

Light brown eggs are deposited singly on both smooth and rough bark but almost never between deep bark ridges. When bark injuries are present, eggs are laid nearby but not directly on the injury.

The brown-headed larva is mostly creamy or whitish in color. Spots appear, however, on the last segment when the borer is fully grown. A free-moving larva is unable to chew its way through uninjured bark. Therefore, it wanders around until an opening in the bark is reached and then tunnels in.

The entire pre-adult stage is spent feeding in the cambium. Borers may be found in various stages of development throughout most of the year. They do not feed in the sapwood. Winter hibernation occurs in the larval stage with pupation taking place in the spring and summer as larvae complete their feeding period. Most of the larvae pupate in the tunnels just below the surface of the outer bark. Occasionally, however, one may emerge and drop to the litter or soil at the base of the tree where transformation to the adult stage takes place. The brown-colored pupa is protected in a silken cocoon constructed with bits of loose bark and grass.

A dogwood showing the damage wrought by the borer, *Thamnosphecia scitula*

CONTROL OF THE BORERS

Occasionally borers may devour one another when crowded. Cannibalism as such, however, does not occur. Migration of borers sometimes takes place before pupation. The free-moving larvae are then open to attack by birds. In addition several species of birds peck at borer infested bark for food. Temperatures as low as —30° F. have not injured borers. Now and then parsites and predators occur as enemies of the larval stage of the borer. They have not been observed in abundance, hence appear to play no important part in controlling the pest.

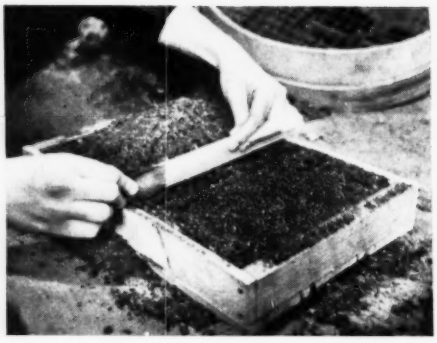
Since the larvae enter only through a definite break in the outer bark, all injuries to the trunk and branches of a dogwood tree should be avoided to prevent infestation. Mechanical injury to trees arises in several ways. Careless use of mowing machines and shearing tools may roughen, break, or loosen the bark at the base of a tree. Cultivating the soil close to the trunk of a dogwood may result in injury to the bark. Pruning small branches or limbs from a tree always provides likely areas of infestation. The stubs should be protected with an asphalt tree paint to prevent borer invasion. For the same reason injured bark may also be painted with this material.

It seems that no matter how carefully a tree may be transplanted, there exists the ever-present risk of injuring the bark. Injury of this kind may be so slight as to go unnoticed. Under such conditions the danger of borer attack may be greatly lessened by wrapping the trunk of newly transplanted trees with kraft crepe paper.

The use of insecticides to control dogwood borers after they entered a tree was, in the past, almost hopeless. However, the more recent development of newer insecticides has provided materials with sufficiently high vapor pressure to assure insecticidal action by reason of their fumigating properties. Lindane and aldrin are included among these materials. They may be applied to borer-infested trees by means of a paint brush or small hand pressure sprayer for control of overwintering borers.

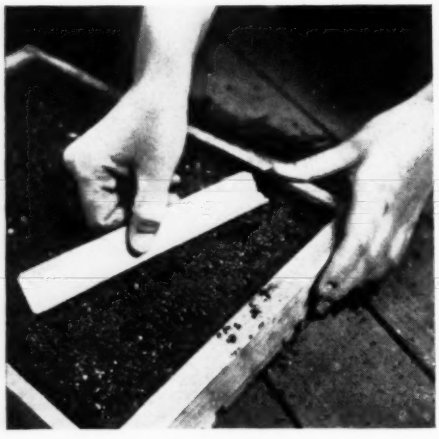
Uninfested dogwood trees may be protected from borer invasion by spraying the trunks and branches with either DDT or dieldrin emulsions several times during the spring and summer. The first application should be made about the time the moths begin to emerge. This will vary with the locality. (June 1 for southern Connecticut.) Several additional treatments at four- to six-week intervals may be necessary for best results. This will certainly be true when trees are growing in an area of serious borer outbreak.

1. When filling flats for seed sowing, first cover the drainage slits with coarse leaves

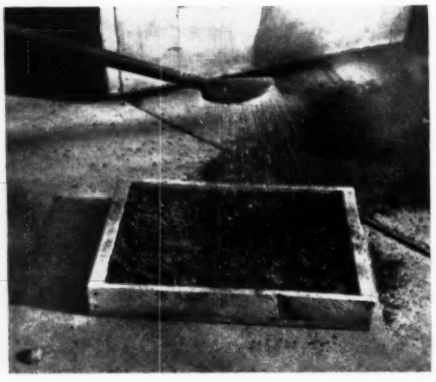


2. Then fill the flat with prepared soil and level it even with the top of the sides

3. Press the soil moderately firm with the finger tips; do not miss corners or edges



4. Stroke the surface with the edge of a piece of wood to level it a little below rim of flat

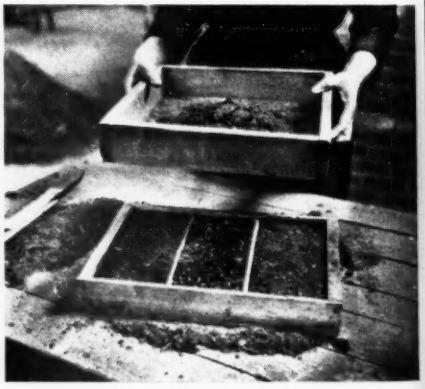


5. Water with a fine spray, for preference using boiling water

6. Scatter the seeds thinly. If more than one kind is sown in a flat, separate them with pieces of cane

7. Some kinds of seeds tend to clump together; if they do, separate them and space them with a pencil point

8. Press the seeds lightly in to prevent them bouncing when soil is sifted over them



9. Sift soil over the seeds to a depth of two or three times their own diameter. Extremely fine seeds need no covering

10. For identification purposes, prepare wooden labels by placing a little thick white paint on them

11. Rub the paint into the label with a cloth and remove all surplus so that the surface is nearly dry; then, immediately—

12. Write with a soft pencil the name of the variety, sowing date, source of seeds, and any other pertinent data

SOWING SEEDS IN FLATS

By T. H. Everett

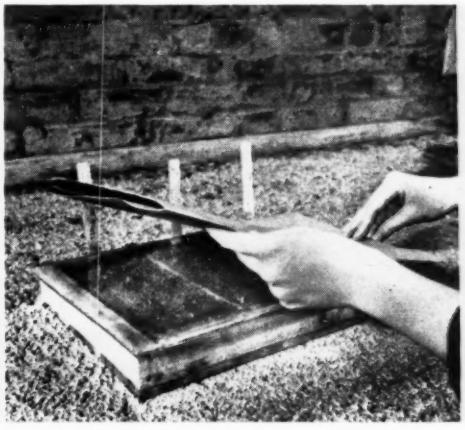
RAISING SEEDLINGS INDOORS is a common practice. When more than a few of one kind are needed, flats (shallow boxes) are generally superior to pots or pans (shallow flower pots) for the purpose. Even when the amount of each kind of seed is modest, two or three varieties that take about the same length of time to germinate may be sown in the same flat if they are separated by pieces of cane or other suitable markers.

Flats two or two and a half inches deep (inside measurements) are entirely satisfactory and require less soil than deeper ones. Provision for drainage should be made by leaving narrow slits between the boards forming the bottoms of the flats or by boring a few holes in them.

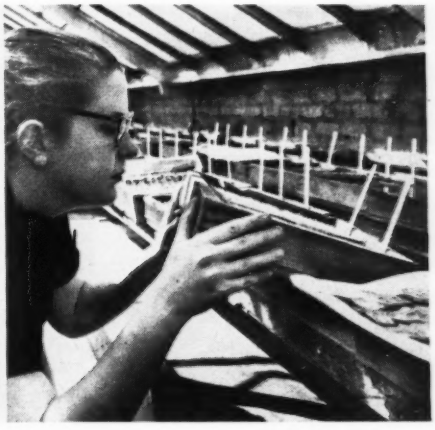
To prevent the soil washing through, a layer of coarse leaves, moss or other suitable material is placed over the flat's bottom, then soil is filled in and leveled even with the rim of the flat. For most seeds equal parts of good topsoil, peat moss or leafmold, and coarse sand, well mixed and passed through a half-inch mesh sieve, is a suitable soil; this basic mixture may be modified for seeds that require special conditions. After roughly leveling, press the soil fairly and evenly firm with the tips of the fingers, paying particular attention to the corners of the flat and around the sides. Then level the surface finally and exactly, taking care that the soil is not higher around the edges than elsewhere. If very fine seeds are to be sown, a thin layer of soil pressed through a quarter-inch mesh may be applied to the surface.

The next step is to soak the soil thoroughly with a fine spray of water — if convenient, the use of boiling

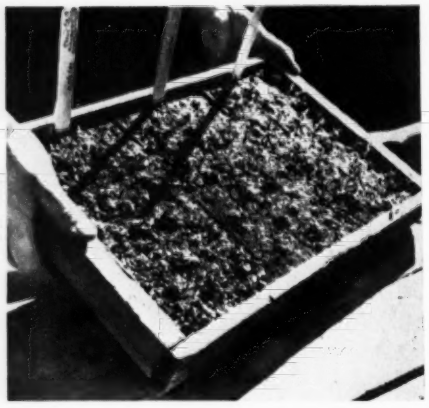
13. Place the labels in position in the flat and, to conserve moisture, cover it with a sheet of glass and



14. Then some paper to keep out light and, with the glass, encourage uniform environmental conditions



15. Examine the flats daily for signs of germination. Glance along the surface of the soil for the first sign of growth



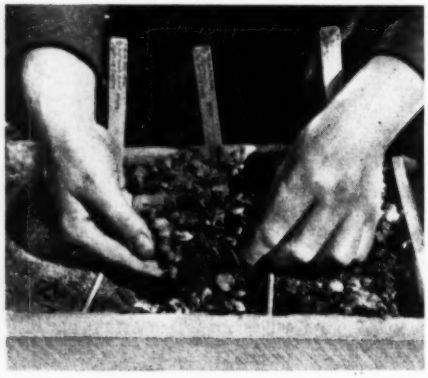
16. As soon as seedlings are up and before they have elongated, remove the glass

water for this purpose is advantageous because it partially sterilizes. Then scatter the seed thinly, press it lightly into the surface (if this is not done, some seeds bounce about when the covering soil is sifted over them) and

17. For a few days shade them from bright sunshine with paper or cheesecloth

cover to two or three times the average diameter of the seed with soil sifted through a fine screen. Press the surface lightly again.

Label each batch of seeds clearly; the method of writing wooden labels shown in the accompanying illustrations is the best. Cover the flat with a sheet of glass and some paper and place in a temperature suitable for germination of the particular seeds sown.



18. When the seedlings have substantial second leaves and begin to crowd each other, they are ready for transplanting

Check the flats daily. If the soil shows signs of drying, water it very carefully with a fine spray. As soon as the seedlings break through the surface, remove the glass but keep the flat shaded from direct sunshine for at least a few days by covering it with a piece of paper or a cheesecloth. Don't let the soil dry at any time but avoid constant saturation. Seedlings develop best when the flat in which they are grown is kept close to the roof glass of a greenhouse or near a window; if they are a long way from the glass, they are likely to become "drawn" or leggy. When the seedlings have developed their second leaves quite fully and are beginning to crowd each other, they are ready for transplanting.

MINIATURE ROSES (from page 48)

has medium dark leaves, a few thorns. Brought out in 1954, the parents are 'Eblouissant' and 'Zee.'

TINKER BELL H.C.M. Pat. 1293. It is a healthy rose, said by Conard-Pyle, its introducer, to be eight inches tall and by the American Rose Annual 1955 to be all of ten. I hold mine trimmed down to five or six to keep it shapely. The one-inch flower ranges anywhere from twenty-five to sixty-five petals; the color varies from pink to light crimson to purplish magenta with, occasionally, white stripes. It fades badly. 'Tinker Bell' has a very lovely bud, of a deep rose-pink, pointed and beautifully shaped. It was bred by Jan de Vink and introduced by Conard-Pyle, I think, in 1954. Its parents are 'Ellen Poulsen' and 'Tom Thumb.' The American Rose Annual's Proof of the Pudding gave it a rating of 7.3 in 1955 and of 7.2 in 1956.

TINY TOT. H.C.M. This, a very dwarf plant, was produced by Thomas Robinson of Porchester Nurseries, Nottingham, England, in 1955. The color is a deep cerise-pink.

TIPTOP. I do not know anything about this rose, except that it is a miniature and was given a second rating by the American Rose Society tests in 1954. I should be glad of some information.

TITANIA. See 'Perla de Alcanada.'

TOM THUMB H.C.M. Pat. 169. And now we come to that stout fellow, small but mighty, the father or grandfather of nearly all of the H.C.Ms. He himself has only one known parent, being a self-sown seedling of *R. Roulettii*. He is only two to five inches tall, squat and compact, with tiny dark leaves, no fragrance, and few thorns. The flowers are a half to three-quarters of an inch wide, twenty petaled, dark crimson with a wide band of white at the base. 'Tom Thumb' was brought out by de Vink in 1935 and introduced in this country by Conard-Pyle in 1936. It is called 'Peon' in England.

TOMMY TUCKER H.C.M. This visitor from England is also a low, shrubby rose, and a fine bloomer. The fat, pear-shaped bud is dark pink. The clustered flowers are a very clear deep pink, paling to blush in the center, and have slight scent. They are one inch wide and open flat into five-pointed stars. The leaves are of medium blue-green, and glistening. There are very few thorns. It was bred by T. Robinson from *R. Roulettii,* which it nearly resembles, X 'Peon.' Although it is somewhat subject to mildew, I consider it one of the best.

TWINKLES H.C.M. Pat. 1407. This is a compact bush, growing two to six inches tall, with glossy pale green leaves, a few thorns, and flowers in clusters. The bud is flesh-pink, the flower white with a slight flush. It is an inch wide, with about sixty petals, and perfume just possible to perceive. Its parents are 'Perla de Montserrat' and an unnamed polyantha seedling. Jan Spik is its breeder; Jackson and Perkins introduced it in 1954. The American Rose Annual, 1956, Proof of the Pudding, p. 244, gives it a rating of 8.4, but I do not find it quite as good as that.

WHEATCROFT'S BABY CRIMSON. See 'Perla de Alcanada.'

WHITE ASTER H.C.M. Pat. Rights Res., is a 1957 introduction from Sequoia Nursery. Mr. Moore writes that the bud is soft pink, flower soft pink changing to white, with narrow ribbon-like petals. A free bloomer, the first flowers open one to five days ahead of surrounding buds in a cluster. The plant is bushy and branches from the soil level; the foliage small, dark green, and medium glossy. The open flowers of 'White Aster' have the appearance of tiny crego asters, and they

show numerous bright yellow stamens. He reports it to be a good garden or potted rose.

WHITE FAIRY H.C.M. This so closely resembles 'Sweet Fairy' that it may be a sport from it, especially as 'White Fairy' itself sometimes sports a pink branch. The flowers are smaller, slightly more double, and have no fragrance.

WILLIE WINKIE H.C.M. It grows four to ten inches tall, but blooms profusely at three. The clustered flowers are one-half inch wide, pale pink, with thirty petals which roll back to show the stamens. The very fat bud is a lovely appleblossom-pink. The small leaves are pale and soft, and the thin stems are covered with a host of tiny thorns.

YIPPY. See 'Granate.'

ZEE. "Climbing miniature seedling used only for breeding, not in commerce. Originated about 1940 from a cross of 'Carolyn Dean' X 'Tom Thumb.' Tiny pink buds and small, rather loose flowers. Tiny foliage. Nearly thornless. Free bloom. Repeats." I quote from a letter sent to me by its breeder, Ralph Moore of Sequoia Nursery.

ZWERG RUBIN. This is a polyantha growing eight to twelve inches tall; it has small, cupped, ruby-red flowers. J. C. Schmidt produced it in 1924 from a 'Rubin' seedling X 'Erna Teschendorff.' (Modern Roses IV, p. 342.)

MARY HAYWOOD H.C.M. Pat Rights Res. Ralph S. Moore of Sequoia Nursery has just sent a brief description of this new miniature, another one of his 1957 introductions: very bushy, free-branching plant with glossy medium-green foliage; abundant continuous bloom—old petals dropping clean while still pink; bud and flower clear pink, bud rounded or only slightly pointed, petals quilled when fully open and similar to hybrid cactus dahlia. 'Mary Haywood' seems to do well in garden and greenhouse.

POTTED PLANTS (from page 45)

much of the winter at this same low temperature. The Martha Washingtons fail to set flower buds if rested at too high a temperature. Azaleas can be given a higher temperature to force them into bloom and then be returned to the cooler one to prolong the flowering period. It is a pity that so many flowering plants are allowed to fade so quickly because of unnecessarily high temperatures.

For those with conventional greenhouses there is a wide range of suitable material to grow in pots. Geraniums are always favorites but they vary in their flowering habits. The gardener should choose varieties that like to blossom in winter. Single ones are very beautiful and one of the very best is the soft salmon-pink 'Emile Zola.' A plant of this variety has been continuously covered with flowers for at least four years and shows no sign of stopping. Interesting plants that will bloom well in the dark winter months include *Swainsona, Iboza, Eranthemum, Sparmannia, Gerbera,* certain orchids, Christmas cactus, begonias, and the vine, *Thunbergia grandiflora,* with large lavender flowers borne off and on all winter.

As warm weather approaches and the sunlight strengthens, the list of plants that flower well in pots becomes still longer. The South African bulbs of which freesias (they are really corms) are examples do their best about March, and other tender bulbous material such as ranunculus and anemones are very colorful. It is better to grow these in pots for spring flowering than to plant them in the outside garden. They may not live through the winter and would certainly not flower well in hot weather.

In March, tuberous begonias, gloxinias and achimenes should be started into growth. They need more heat at this time than when growth is well established. Tuberous begonias in pots often look better than those set in the ground. There is seldom an appropriate place for the latter in the outside garden, and their exotic appearance seems to detract from the more natural adjacent plantings. When potted plants of this sort are placed outdoors in summer, they should not be exposed to strong winds. They need shade but not the dim light found under awnings. By watching the plants carefully, it is soon evident whether they have been put in favorable spots. Oleanders, hibiscus, lantana, and other sun-loving species are easily made happy, but the perfect spot for fuchsias is not so easily found. When this is done, however, there is no more beautiful potted plant. All the summer bloomers carry on over a long period if occasionally pinched back and fed.

FRAGRANT GARDEN (from page 35)

feeling them. Groups of brightly flowering shrubs, such as forsythias, have been planted for the pleasure of the partially sighted. There is a row of French hybrid lilacs and flowering crabs with a groundcover of English violets bordering one of the walks. The crabs are only one of the small trees chosen for fruit as well as flower in the hope that they will attract song birds.

In the raised beds, which will be planted with a succession of fragrant bulbs and annuals, herbs and geraniums each year, there are also permanent groups of low-growing Japanese yew, daphne, euonymus, and boxwood. In the wider raised beds beside the residence, where bedroom windows will be open to fragrant breezes, we have also used some of the varieties of dwarf philadelphus, *Viburnum Carlesii* and *Carlcephalum,* and fragrant shrub roses. Among them have been planted those special flowers with night fragrance—nicotine, heliotrope, and stocks.

Where the curved walk winds through a special shrub planting there are spice-bush, quince, deutzia, euonymus, forsythia, five more varieties of flowering crab, magnolia, philadelphus, shadbush, buddleia, hawthorn (the blind asked for some thorny things), Russian olive, jetbead, Japanese cherries, more lilacs, and both shrub and floribunda roses.

Flanking the tall glass entrance doors to the dining room are saucer magnolias. When they are mature their scented waxy flowers and later their leaves and trunks may be felt from the walks that converge on the doorway. Also near this doorway honeysuckle has been planted.

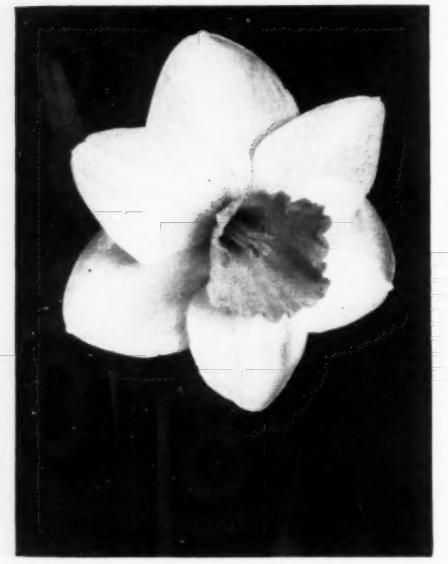
From Rowancroft Garden in Meadowvale came a very special gift of two Coronation oaks grown from acorns of English oaks in Windsor Great Forest in the year of the crowning of Queen Elizabeth.

The Garden Club of Toronto considers it to be one of its responsibilities to make any information it has on the making of this Fragrant Garden available to anyone who wishes to have it. A booklet with the story of the Garden and the plant list will be available in the early spring of 1957, and blueprints, planting plans, photographs and samples of labels can be provided at cost to any group.

English and Irish

DAFFODILS

By Kenneth D. Smith



'Tudor Minstrel,' very striking with pure white perianth and frilled yellow cup

DAFFODIL FANCIERS all over the world realize that the English and Irish daffodil hybridizers stand in a class by themselves. Their creations are perfection; the perianths of the flowers are smooth and usually overlapping, the coronas are of clear colors, the stout stalks support the blooms so that they look up. They have graduated from the days of the twisted perianth and also have shied away from the wide coronas with small perianths, that give the effect of a fried egg.

If it had not been for an English iris friend, now on the Daffodil Committee of the Royal Horticultural Society, my collection of the English and Irish daffodils would have been long delayed. But some ten or twelve years ago, he began writing each year to tell me what were the best varieties on display at the London shows, and relying on his judgment I purchased all of the newest novelties, some still under seedling number. As a result my garden contains quite a remarkable collection of the latest originations. We have lived through the years with this collection, studying them morning, noon, and night.

Being a hybridizer, I wanted to see what was being accomplished abroad, so I decided the important thing to do was to visit both of the London shows and as many hybridizers' gardens in England as time permitted. In late March 1954, Mrs. Smith and I arrived in London in time for the first show, and in the two weeks intervening before the second show we were able to visit many important gardens and meet many hybridizers. We had many courtesies extended to us — the most important that we were allowed to see the exhibits being set up at Westminster before they were judged. Naturally, we instinctively judged as we went along and our egos rose, because we usually found we were correct in all of the important classes. Here we saw for the first time Guy Wilson's magnificent white trumpet 'Empress of Ireland.' This large refined white trumpet, nearly five inches in diameter, is borne on at least a sixteen-inch stem; the white perianth is smooth, very broad and overlapping, the white trumpet-shaped corona is approximately the same length as the perianth segments (usually two inches) and two inches across at its reflexed and frilled margin. Not only do I consider it the finest white trumpet yet produced, but so do the English judges, for in 1956, at Westminster, it received unanimously the Award of Merit. I was fortunate enough to secure a bulb in 1955, and in 1956 it threw up three fine stalks in my garden.

We also saw many fine unintroduced seedlings; 40-73 of Wilson's, now named 'Fintona,' very, very pink trumpet and fine white perianth, which will be a 1957 introduction. We also selected 'Easter Moon' (Wilson), then under seedling number 38-45, the best in the show, and we were right. It is a tall flower, has a broad overlapping perianth of the most faultless waxy texture and substance, short cup and purest white throughout with lime-green at the base of the cup. I have quite a fondness for flowers having a green base, for that color adds much to the individual beauty of a bloom.

J.' Lionell Richardson's specialty has been red cups, and I was really thrilled when I saw his 'Firecracker,' which was definitely the deepest of all red cups with a brightly contrasting deep yellow perianth. His 'Salmon Trout' was very spectacular, large and lovely, the cup a most beautiful salmon-pink. Unfortunately on Dongan Hills it does not attain the same large size that it does in Ireland. Also 'Ceylon' (Richardson) has been a bitter disappointment to me, for it has been considered in England the finest red and yellow (Class 2a) seen to date, and as grown there is truly magnificent.

'Arbor,' a magnificent show flower, has a large deep reddish orange saucer-shaped cup

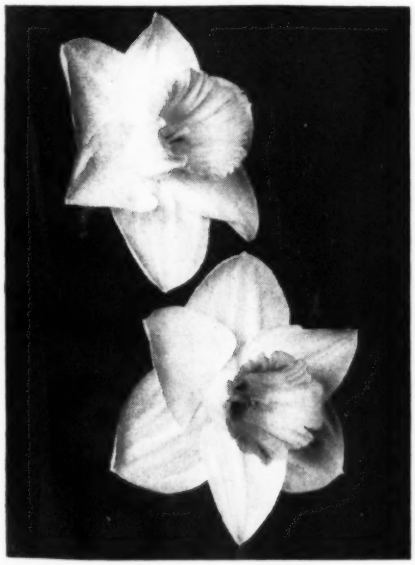
I had Richardson's 'Arbar' when it was still under a seedling number. It is a 2b with a large saucer-shaped cup of deep reddish orange. This is a magnificent show flower and grows exceptionally well for me on tall, stout stalks and makes a compelling garden clump.

'Double Event,' also Richardson, is a striking novelty. It is like a semi-double camellia, a round flower; the larger segments are pure white and interspersed among them in the center are small segments of soft lemon-yellow. This received in 1956 a First Class Certificate, the highest award the Royal Horticultural Society can give. 'Tudor Minstrel' also received in the same year a F.C.C. This is an immense flower when well grown, very striking with pure white perianth and frilled deep yellow cup.

Among the most interesting daffodils we saw were those in Class VI, i.e., Cyclamineus; C. F. Coleman had produced 'Dove Wings,' A.M., and 'Jenny,' F.C.C., both of which had been introduced by Richardson. Later we saw

Coleman's 'Charity May' growing at Wisley (the trial garden of the R.H.S.) where it had just been given an award; it is much larger than his other two and is a smooth rich yellow flower, having the characteristic reflexed perianth of this class. Ordinarily, few people grow any in this class, but the real fancier considers them, together with the miniatures, the most delightful of all. The master of the miniatures is Alec Gray, and it was pure pleasure to see his exhibit. His 'April Tears,' a charming little yellow Triandrus hybrid, is quite well known and worth knowing, too, but imagine the same flower in purest waxen white! That is what 'Raindrop' is. Both are completely hardy here. 'Xit,' (Gray also) is a most perfect and beautiful 3c and it is a miniature, too, growing six inches tall; the lovely white flower has a small green eye. 'Thoughtful' and 'Sidhe,' both 5a, are sulphur-yellow, and several small flowers nod on one stem; 'Phyllida Garth,' in the same class, is quite a lot larger and taller, white throughout with a beautifully frilled cup.

Class 11a is the one having the fewest representatives, and in a flower show most of the entries will be 'Chungking' (Guy Wilson) which has broad rounded perianth petals of clear, rich gold and an intense, vivid red small cup. It is, indeed, a beautiful and striking flower. Now, there are two newcomers of note to challenge 'Chungking.' 'Jezebel' (A. M., Wilson) has a grand, smooth, perianth of deep reddish gold, and a shallow crown of deep brick-red. 'Green Howard' (Johnstone) is a delectable pastel of chartreuse; the red-edged cup, being sufficiently darker than the perianth, gives the flower a pleasing accent.



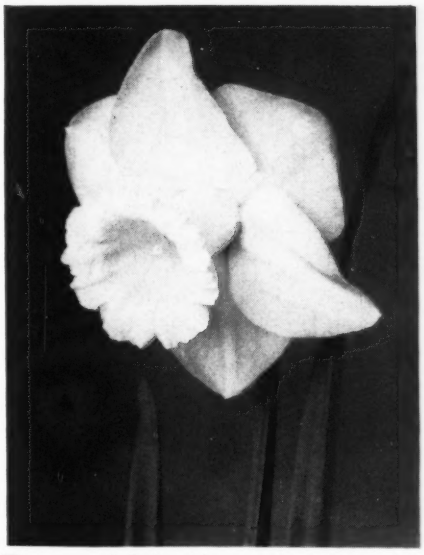
'Salmon Trout' is spectacular with its beautiful salmon-pink cup

When daffodils are mentioned, most people think of the bright yellow trumpets—and that is as it should be, for who can imagine springtime without them! Today, we may take our choice among many fine ones. 'Moonstruck' (Guy Wilson) is very early; immense, soft yellow of perfect form and most beautiful. 'Mahee' (Wilson) is really late (most surprising in a yellow trumpet), a deep gold of great purity, and 'Virtue,' another one of G. Wilson's, is a very appealing daffodil of finest quality, a true aristocrat of shining, silken smooth, medium yellow. Richardson's 'Ark Royal' is a mid-season, boldly beautiful flower of deep golden-yellow; 'Yellow Idol' (Richardson) a clear medium yellow, large flower, fine substance, and one of the best; 'Wexford' (Richardson) soft gold, fine in the garden and a good show flower; and 'Kingscourt' (Richardson), one of the finest exhibition flowers on any show bench.

I could go on and on; 'Green Island,' 'Blarney,' 'Bryher,' 'Dallas,' and the latest of all to bloom, 'Frigid,' but you must discover these things for yourself. I am only pointing the way.

The list of favorites at the present time (all English, Irish, or Australian daffodils) of my wife, Catherine Hemingway Smith, and myself are as follows:

Class 1a: 'Mahee,' 'Moonstruck,' 'Virtue,' 'Kingscourt' and 'Ark Royal'
1b: 'Preamble,' 'Trousseau,' 'Caroline Fox,' 'Effective' and 'Foresight'
1c: 'Empress of Ireland,' 'Vigil,' 'Cantatrice,' 'White Prospect' and 'Truce'
1d: 'Spellbinder'
Class 2a: (Yellow cups) 'Wexford,' 'Broadwater,' 'Golden Torch' and 'Leitrim'
2a: (Red cups) 'Firecracker,' 'Armada,' 'Red Goblet,' 'Dunkeld' and "Narvik'
2b: (Yellow cups) 'My Love,' 'Green Island' and 'Innesfallen'
2b: (Red cups) 'Arbar,' 'Daviot,' 'Red April,' 'King Cardinal,' 'Red Hackle' and 'Nairobi'
2c: 'Easter Moon,' 'Pigeon,' 'Glendalough' and "Killaloe'
2d: 'Binkie'
Class 3a: 'Jezebel,' 'Chungking,' 'Green Howard' and 'Orissa'
3b: 'Blarney,' 'Tulyar,' 'Nearula,' 'Limerick' and 'Matapan'
3c: 'Bryher,' 'Dallas,' 'Frigid,' 'Altyre,' 'Foggy Dew' and 'Chinese White'



'Empress of Ireland,' an outstanding white trumpet, won the Award of Merit at the 1956 Westminster Show

Class 4 : 'Swansdown' and 'Double Event'
Class 5 : 'Phyllida Garth' and 'Silver Chimes'
Class 6 : 'Charity May,' 'Jenny,' and 'Bartley'
Class 7 : 'Trevithian,' 'Cherie,' and 'Cheyenne'
Class 8 : 'Chinita'
Class 9 : 'Actaea,' 'Sea Green' and 'Cantabile'
Miniatures: 'Xit,' 'Raindrop,' 'Capax Plenus' and 'Cyclataz'
Pinks: 'Karanja,' 'Pensive,' 'Fintona,' 'Salmon Trout,' 'Lunar Rainbow,' 'Maidens Blush' and 'Wild Rose'

As is usually the case, the newest novelties are very scarce and they naturally command a high price(as much as $140 a bulb). But many of those listed as our favorites are now obtainable in America from dealers who specialize in growing daffodils—and the prices of many are surprisingly small.

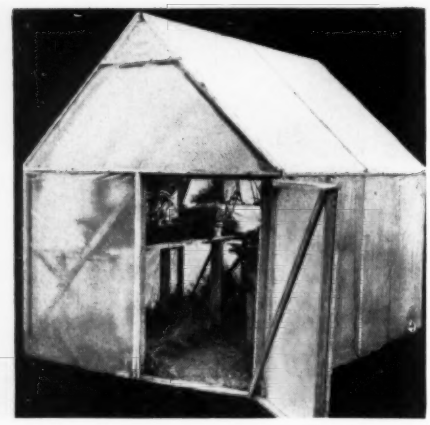
CHRYSANTHEMUM CUTTINGS

FOR MEMBERS

In response to many requests, we are planning to make rooted chrysanthemum cuttings available to our members in Spring 1957.

Please bear this in mind when considering your plant requirements for the coming year and if interested in this offer, let us know.

By these special plant offerings, we broaden our service to members—and make membership in The New York Botanical Garden all the more worthwhile.



PLASTIC GREENHOUSES FOR HOME GARDENERS

By E. M. Emmert

EXPERIMENTATION with plastic greenhouses has been going on for some time in various agricultural experiment stations throughout the country. At the University of Kentucky, after many years of experimentation, we have found that it has many advantages over glass greenhouses. Its use, by no means limited to large-scale agriculture, can realize the dream of many a home gardener to own his own greenhouse.

Certainly much less expensive, the plastic greenhouse enables home gardeners to carry plants through the winter and to grow out-of-season flowers and vegetables. Furthermore, due to increased humidity and better light diffusion, plants grow better under plastic than under glass, especially African violets, tomatoes, Bibb and leaf lettuce, and a great variety of other vegetable and flower plants. These facts have been proven by research at the University of Kentucky where comparisons between growth under glass and plastic have been made for many years.

CONSTRUCTION. Presently, plastic greenhouses are made with wood frames, and covered with polyethylene. The framework for plastic is much less costly than for glass, and the plastic itself is about one twentieth as costly as glass to install. The resistance to wind, snow, and rain is excellent. Plastic greenhouses have taken winds up to seventy miles per hour. The polyethylene plastic cover withstands all kinds of winter weather, but has a tendency to deteriorate to some degree in the summer sun. However, polyethylene is very inexpensive and periodic replacements are exteremely easy to make. Some new types of plastic which last longer are being tried but as yet have not been sufficiently tested. If they prove economical, the same framework as used for polyethylene can be used. A new one is being tested now by the University of Kentucky that is more transparent than glass. It can be sealed readily with an acetone liquid, should repair become necessary. Anyone using a polyethylene house can readily change to these long-lasting plastics at any time they are proven. Some of the new long lasting plastics give promise of being almost as cheap as polyethylene and still lasting for years. Of course, it takes time to test these plastic materials out. A gardener can proceed to build a polyethylene house and change over any time he is convinced it would pay to do so. Of course, polyethylene is so cheap and efficient and the renewal costs are so small that it may pay to renew it each fall. One would then have a brand new covering which is clean and not made grimy by weather and smoke. It is good for a greenhouse to be aired out through the summer months, and many plants do better when exposed to air and sunshine.

VENTILATION. Although plants grow under plastic even better than under glass, this does not eliminate the need for ventilation and proper fungicides. Ventilators should be present for winter use. Also, fans that blow out humidity, pull in fresh air, and help distribute heat, will add to the efficiency of the plastic greenhouse. The fan may be installed so that it blows through inexpensive plastic tubes, thus carrying heat under benches or alongside growing plants. This keeps the heat from hanging in the top of the house and conducts it to where it really makes plants grow. A small fan can be installed in the small house, such as would be used by the home gardener, and do the same fine job that larger fans are doing in the University of Kentucky plastic houses.

HEATING. The plastic greenhouse is easier and more economical to heat than the glass greenhouse. A propane gas heater is recommended because it is least likely to give off harmful fumes, such as are produced when oil or natural gas is used. Fumes produced by propane gas are actually beneficial, if not present in excessive concentrations. Any heater reduces oxygen and increases humidity and carbon dioxide, both of which are good for plants, up to a certain degree.

If a double layer of polyethylene is used for covering the greenhouse, heating costs are thereby cut in half. By using flats with wire and black plastic bottoms set over plastic heating in a double-lined plastic house, plants will grow in severe winter weather with remarkably small cost and little care. The black flats and heating tubes last for many years.

A complete, easily assembled unit for the construction of small plastic greenhouses for home gardeners is now available. It has all the necessary attributes and parts and comes in kit form as a complete "do-it-yourself" unit. The interested gardener may obtain free literature on request from the manufacturer, Plastic Greenhouses, Inc., 520 Fifth Avenue, New York 36, N. Y.

If further information is desired on the various uses of plastic in agriculture, pamphlets are available from the Department of Horticulture of the University of Kentucky, Lexington, Ky.

MULCHES (from page 43)

in order to be most effective, must be worked closely around the stems. I have seen pebbles used as a mulch on alpines but did not notice any superior results over those mulched with pine needles. Moreover, in commercial growing where every few years transplanting is necessary, the ease and convenience with which pine needles are removed makes them, in my experience, far superior to pebbles. The leaves of spruce and tamarack, being both short and slender, are exceptionally good mulching for dwarf or very young plants. These, or any other small needles, are applied by being gently broadcast over the plants to the desired thickness. Any needles which adhere to the plants may easily be removed by gently brushing over the rows with a light small stick.

Beneath plants three years or older which are lined out either in the field in full sun or under lath shade, depending on the parentage, I spread a mulch of red pine needles approximately three to four inches deep over the entire area.

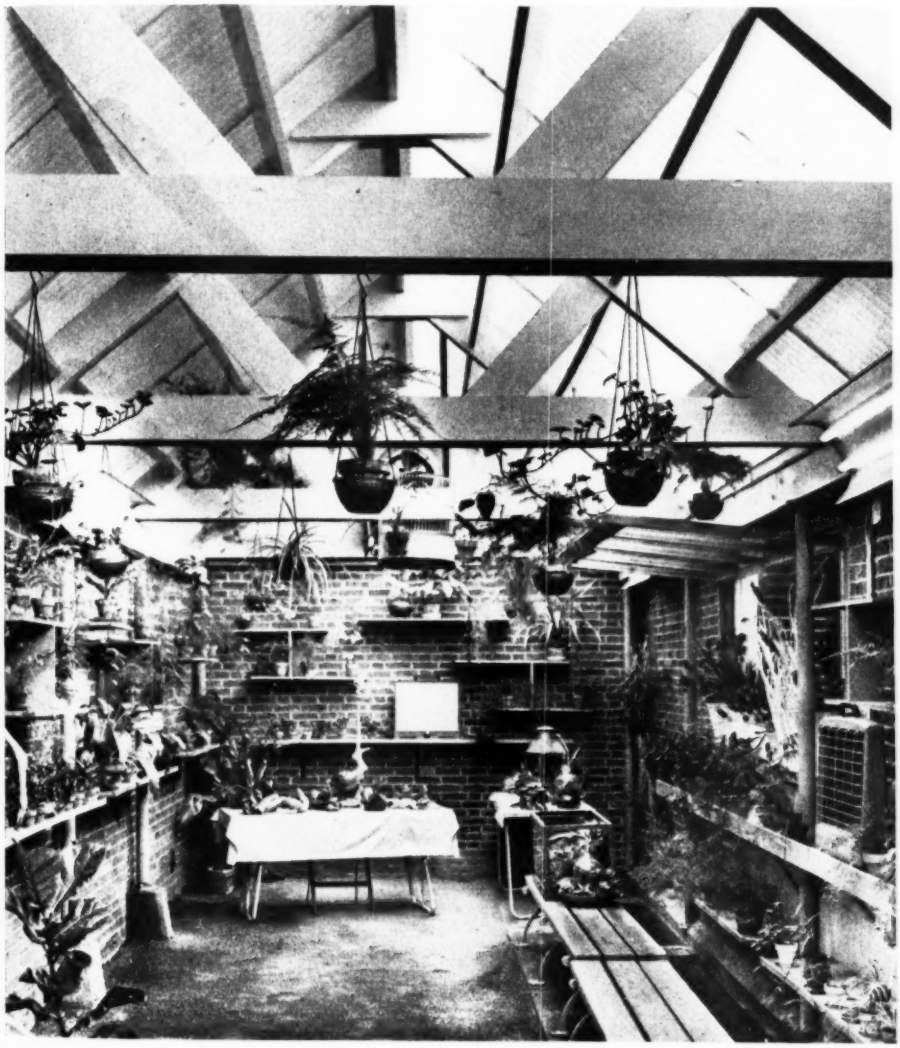
After settling which takes several months, the depth is reduced to about two inches. If undisturbed such a mulch will serve the plants three to four years. If the plants are removed for any reason, the mulch, if scraped away before digging, can be replaced and reused. Neat in appearance, a needle mulch settles to an even, tidy cover that never can mat down or become sodden. The criss-crossing, interwoven needles allow good aereation, yet never under any conditions become scattered by gusts of wind. No unsightly weights in the form of sticks or lengths of board that might entangle spray equipment or otherwise interfere with day to day working around the plants are necessary to hold the mulch in place. Both the insulating and moisture-holding capacity are superb.

Young plants out of pots or out of the rooting frames and older stock up to the time they are lined in the field or lath house are mulched with either spruce, tamarack, white pine or shredded needles of the more coarser pines. This mulch need not be three to four inches in depth, since the smaller needles apparently insulate equally well when spread to only half that thickness. At the height of the summer during the hottest days of the season, when the temperature soared into the low hundreds and high nineties, the temperature two to three inches under such a mulch hovered in the mid-seventies.

Oak leaves are a good mulch, and for that matter I know of no deciduous leaves that are not satisfactory. Shredded they are less apt to be caught by the wind and will cling better to the ground; but as this entails considerable extra work, it is not usually practised commercially for plants lined in the fields. It is being done occasionally for small liners. Large leaves in such a situation almost seem to smother little plants. However, the old belief that the use of maple and elm leaves invites disaster because of their alkaline residue upon decomposition has not, in my experience, proved true. I have seen many rhododendrons mulched with such a covering without the plants suffering any ill effects. The rapidity with which leaves decompose has a large influence on the acidity or alkalinity of their residue. The more rapid the rate the more alkaline. And so it might be that even oak leaves, rapidly decayed, would tend to be neutral. The chief objection to a leaf mulch is their blowing about, accumulating deep in some areas and leaving other sections bare. Especially around plants where the mulching is left to nature's hand, the thick saturated layers matted together form an almost impervious layer, defeating one of the prime requisites of a mulch: to be light, airy and allow free air circulation.

Peat moss can be used for mulching for lack of a more suitable material. It is not one of the better mulches. I have never seen it used commercially on any scale. Around the home it gives the beds a somewhat manicured appearance, perhaps too much so for rhododendrons. A probable victim of high winds it must be replaced every year, or nearly every year. An outstanding fault and major drawback of a peat mulch is that once dry it sheds water like a duck. Therefore, to serve the purpose of a mulch, it must be kept moist with periodic sprinklings during the hot dry summer, perhaps once a week. The thicker the layer of peat, the less apt it is to dry. I have never observed the fine rootlets grow to the surface of the mulch and be destroyed, though in theory it seems plausible. From past experience in plunging potted rhododendrons into the peat, I can recall numerous instances when the roots reached into this medium just below the surface, without any apparent harm to the plants. If some roots did rest on the top or near the top of the peat for a brief time before being killed, it was not discernible. My theory is that the roots will shun any hot dry area and will reach for conditions advantageous to their development.

(Continued on page 60)



With its brick walls and plastic roof, the room adjacent to the Conservatory of The New York Botanical Garden makes an attractive meeting place for the Hobby Club

YOUTH PROGRAM
AT THE NEW YORK BOTANICAL GARDEN

Gardening for and with the Younger Generation

ABOUT A YEAR AGO The New York Botanical Garden, recognizing the fact that too crowded living conditions and too much free time without supervision left many young people at loose ends, started a Youth Program. This program was designed to take children off the city streets and furnish them with constructive, character-building activities.

Nature Walks were arranged in different sections of the grounds to stimulate an interest in the wonders of nature, and "Nature Guides" (in the form of mimeographed outlines) were provided for parent-teacher organizations and teachers who bring groups of school children to the Garden.

A Hobby Club for boys and girls was organized on a competitive basis. Any child may become a member, and if he grows a plant successfully for three months, he gets a plant as his reward. If the child grows the prize plant well, he receives another prize plant. The young people may visit the Conservatory on any Saturday between the hours of 10 a.m. and 4:30 p.m. for instruction and guidance.

A summer course in gardening and nature study for children who must remain in the city during the vacation period is being organized. And a complete school garden program, with children growing vegetables and flowers on individual plots under expert guidance, will be ready to start this spring.

A trial gardening project for St. Joseph's School for the Deaf in New York City has worked out so successfully that the school is now including gardening as one of its regular activities. The care of house plants, flower arrangements, the use of greens for Christmas decorations, seed sowing, propagation—these are a part of the schedule prepared and supervised by The New York Botanical Garden. The worth-whileness of this project is clearly expressed in the following quotation from the letter addressed by Grace M. Long, Principal of St. Joseph's School for the Deaf, to A. C. Pfander, the Garden's Administrator:

"May I take your time to tell you just a few advantages as we see it here? The cultural values have been great. The children have grown in a love and appreciation of the beautiful through such lessons as making a terrarium, arranging Thanksgiving table decorations, Christmas corsages, and even a knowledge and skill in converting carrots and sweet potatoes into delightful plant effects. The homes of these children have been enriched by the note of beauty each child has been able to bring there, especially the homes in which such things had hitherto been looked on as luxuries beyond their reach.

Some of the young contestants in the Flower Show on May 12, 1956

"The value of proper use of leisure time is an outgrowth, and a new and delightful hobby has been introduced especially through the lessons in leaf identification. This has also sharpened the visual acuity of these children who must make their eyes supply for ears. It has given our children who are just adjusting to a day program a chance to be of some importance in their own neighborhood. They have something of interest to show the hearing children in their neighborhood, and those who understand the social development of children know the value of this in the process of getting 'in' to the neighborhood 'gang.'

"We see the present plan as a vocational venture for the future. Several parents have noted this implication. They are able to visualize a pleasant and profitable position for their children in a field where their handicap will not interfere with their success."

. Under T. H. Everett, Curator of Education and Horticulturist, the Plant Workshop and Flower Show successfully inaugurated in the spring of 1956, with five hundred and eighty-four children registered in the Plant Workshop and four hundred and ninety-four entries in the flower show, will be repeated in the spring of 1957. The pro-

Members of the Hobby Club attentively watch Louis Politi, Head Gardener of The New York Botanical Garden, as he instructs them on plant care. The group includes several children from St. Joseph's School for the Deaf.

Children are busily arranging their entries in the tenth annual chrysanthemum arrangement competition at the Garden, October 20, 1956

gram, in which the Ninth District of the Federated Garden Clubs of New York State cooperates, consists of three sessions of growing and propagating plants, planting terrariums, making "animals" from vegetables, and arranging flowers. The workshop is open to children from six to thirteen years old, the flower show from six to eighteen years of age.

And on October 26, 1957, the eleventh annual chrysanthemum flower arrangement competition for children from the fifth through ninth grades of Bronx and Manhattan schools will be held. It is thrilling to see with what enthusiasm the children enter into the spirit of this competition. And several teen-age girls, who participated from the fifth through ninth grades and are no longer eligible, have requested a special teen-age class.

At one of the sessions of the Central Atlantic Regional Meeting of the National Council of State Garden Clubs, Inc., held at Annapolis, Maryland, in November 1956, Mrs. Robert T. Mehl, Regional Director, stated, "Gardening is a spiritual force, necessary in the chaotic world. Junior gardening is vitally important, giving young people a sense of responsibility, an appreciation of true values, an intimate association with the real things of life. Young people who put their hands in God's green earth, who become acquainted with living, growing things — with plants and birds and animals — are much less prone to getting into unpleasant difficulties.

"Keep on an even keel with juniors —and never put off till tomorrow what you can do today to help them learn about and benefit from the spiritual values of gardening.

"The dominant trend of these modern times is the unprecedented technological advances which are serving to increase leisure. We must learn what to do with it—and we must show the young people what to do with theirs. Surely there is no better way to fill some of their increased play time than with well-planned Junior Gardening Programs."

During the Junior Garden Clubs Forum at the Annapolis Conference, which the Editor of The Garden Journal of The New York Botanical Garden attended, some interesting ideas were contributed by the Maryland Junior Garden Club chairmen and by Mrs. Douglas Valentine, chairman of Junior Gardening of the Garden Club of New Jersey, Inc. The latter's suggestions for planning a junior flower show and especially the suggestions for judging a junior show have long been needed—we consider them a real contribution. With permission, the following is quoted from her report:

"Judging a junior show presents a great challenge. The successful junior judge must project herself into the mind and thinking of a child. For one who has been trained to judge the work of adults, this often presents a complete

Leader and members of the Order of the Arrow, Boy Scouts of America, of the Bronx turn over the manure pile at The New York Botanical Garden. This is a service organization of honor Scouts, and its members are interested in conservation and have planted seven hundred eighteen- to twenty-four-inch hemlock seedlings in the Hemlock Forest. They have helped to lay a path and perform other useful deeds at the Garden.

Michael Krammer, totally deaf, spent the summer working in the greenhouse under an occupational therapy program

reversal of approach. With juniors, *imagination* is usually the outstanding quality.

"As a guide for those who judge at a junior show, this suggested point scoring may be helpful:

Imagination	25
Condition of material and neatness of work	25
Design	20
Color	10
Suitable combinations	10
Adherence to schedule	10

Mrs. Anna Freeman Danzer, chairman of the Junior Garden Clubs of the Fifth District of the Federated Garden Clubs of Maryland, Inc., in her report before the Forum stated that "the children of a community have the opportunity to develop into healthy happy citizens by a program that will give them a knowledge of conservation and how to protect our natural resources, an appreciation of the beauty around them, that will increase their observation of nature, of birds. . . . A child who studies bird life, who draws pictures of birds or builds a bird house or bird bath, will not kill birds and rob their nests. A child who is taught to understand nature, who is kept busy growing and arranging flowers, will have little time or inclination to be a delinquent. . . . My objective is to have a junior club in every club in District Five; the slogan—to create within a child's heart and mind a love for the beautiful, the knowledge and care of the earth's treasures."

Call it School Gardening, as it is called in the big cities of New York, Cleveland, Detroit — all pioneers in this movement thirty-odd years ago. Call it Junior Gardening as do the garden clubs within the National Council of State Garden Clubs, Inc., — with some of the garden clubs Junior Gardening has been a long-time project, with many it is a recent undertaking. Call it Gardening For and With the Younger Generation as we do here at The New York Botanical Garden—and the *with* is as important as the *for*. The program for young gardeners may be all that one could desire, but unless those who carry out such a program are enthusiastic about gardening *with* the juniors, the undertaking will not be effective.

So whatever you may choose to call the endeavor to acquaint young people from six to sixteen with an understanding and an appreciation of nature, conservation, gardening, flower arranging, you, nevertheless, will agree that the potentialities are remarkable.

Gardening For and With the Younger Generation, when fully developed, will benefit a large number of the rising citizens of our country.

Children from the Bird S. Coler Hospital for muscular distrophy are given a ride on "The Floral Flyer"

MULCHES (from page 57)

The words "sawdust mulch" are becoming about as controversial as the word "hardiness." There always seems to be someone who will dispute any statement that is made. In the last few years I have become thoroughly convinced that some sorts of sawdust have their useful place in certain phases of rhododendron culture. As a permanent mulch sawdust can be used, and with success. However, the material must be coarse enough to allow ample air and water circulation. Sawdust from a craftsman's shop usually is too fine and will pack and cake on drying. Sawdust from the mill where the rough logs are cut is coarser and more satisfactory. Of the many hardwoods and softwoods native to the East, the only sawdust that has decidedly resulted in utter failure for me is white pine *(Pinus Strobus)*. In instances enough to prove conclusive, a mulch of this material, when fresh, stunted and even killed plants. Death was not confined to shrubby ericaceous plants but to many annuals and herbaceous perennials as well. There seemed to be some toxic effect on these plants and death had no connection with a lack of nitrogen, for nitrogen was present in abundance. This is the only sawdust I have ever known to be so disastrous. I have seen plants thriving under a cooling cover of sawdust. It is a first-rate insulator, and temperature readings under equal depths of sawdust as compared with other valuable mulch materials left no doubt but that those plants under sawdust had cooler roots by a few degrees.

We know that sawdust (mainly cellulose and lignin) in its decomposition to humus will borrow nitrogen from the soil. This is brought about by the cellulose bacteria which demand for their existence more nitrogen than can be supplied by the wood. They therefore take nitrogen from the soil, nitrogen that would normally be used in the

growth of plants. And this nitrogen is then later returned to the soil upon the death of the bacteria. In this temporary process of decay we must supply small amounts of nitrogen to the plants (inorganic being more readily available) to supplement that which has been borrowed from the soil. This amount has been established at two pounds per hundred square feet of surface for every inch depth of sawdust mulch applied. It may vary with the kind of sawdust but probably ever so slightly so that the above rule will still apply. After the mulch has been in place a year, the annual spring feeding should cover the needs of the plants. If not, a trace of additional inorganic nitrogen can be added.

The commercial use of sawdust, which resulted from accessibility and low cost and the ease of application, has, from my observations of its use from Oregon to New Jersey, resulted in many failures. In commercial growing a crop is removed from an area every few years either to be re-spaced or to be sold. And it is here the trouble begins, for it is when these plants are lifted that some mulch, left from digging, falls into the hole and the sawdust becomes an ingredient of the soil. Perhaps meticulous care might prevent this but I have never seen it so, and in every instance where plants were removed, sawdust, only partially decomposed, was mixed with the soil and the next plants placed there had to compete with it for nitrogen. Many sorts of woods (as sawdust) take a dozen years or more to break down and in this time several crops of rhododendrons can be taken from a given area. Each time, more sawdust enters the soil and each time the supplemental nitrogen feeding becomes more grotesquely complicated. I have seen it become so hopelessly disastrous that, as a consequence, fields were left fallow for years.

The theory that periodic feeding will eliminate this fault is weak. If in the late summer with leaves showing deficiency symptoms, we could ascertain with any degree of accuracy precisely how much nitrogen is needed, a safe application might be made. However this is impossible, for we have sawdust both as a mulch and as a soil amendment in various stages of decay, possibly complicated by several different kinds of wood, and to try to supply the proper amount without overstimulating, even to the slightest degree, at such a critical time in the plants' growth cycle just before cold weather is, in my opinion, next to impossible. In sections which are subject to extremes of climate both in summer and winter, any measures which alter the plants' natural metabolism, even ever so slightly, can be fatal at these sustained periods of high or low temperatures. I have also seen the quick death of plants from the effect of sawdust in the soil. In other instances, growth was retarded for a year before returning to normal. Here is an account from a close friend of mine and his unfortunate experiences with sawdust:

1. Used as a soil amendment and also as a mulch for a group of "Mollis" hybrid azaleas. Initial growth slow, no chlorosis; in a couple of years plants resumed regular growth rate.

2. Used as a soil amendment and also as a mulch for a small group of Catawbiense hybrid rhododendrons. Chlorosis and restricted growth evident to such an extent that it was necessary to move plants out of the sawdust plot to save them.

3. Used as a soil amendment and also as a mulch for a large group of *R. calendulaceum* and other species of the Luteum Subseries. Some initial chlorosis but no growth restrictions and results generally satisfactory.

4. Used as a soil amendment and as a mulch for a large group of hybrid seedlings from my own crosses. Results all but disastrous. Immediate chlorosis followed by an epidemic of all sorts of leaf-spotting fungi, and then a virulent epidemic of *Phytopthera Cinnamomi.* Growth sharply restricted. About thirty-five percent of the plants in the plot were lost and an occasional plant still drops out more than a year later.

There have been other instances when the use of sawdust was followed by an epidemic of *Phytopthera* with such suspicious promptness that some pathologists believe it is quite possible for the sawdust to act as a carrier of this pathogen.

In innumerable cases where sawdust has been used as a constituent of the soil, I have seen the disparaging evidence of failure and heard the complaints against it by those who rogued out the dead plants. I have tried to keep abreast of all advances and progress in the use of sawdust as a soil amendment and I have yet to receive any reliable recommendations based on critical experiments over a period of years that prove beyond the shadow of doubt the safety of the material. In my view, its use should be confined to mulching of rhododendrons which are permanently planted.

Wood chips make an excellent permanent mulch. The only exception I know of is eastern white pine which has the same effect on the plants as pine sawdust. Today huge shredders which grind up limbs pruned in line clearance and street shade tree maintenance are a source of large quantities of good mulch. Chips the size of a quarter and smaller and twigs and pieces up to four to six inches long, mixed with chopped leaves, provide a material that will prove a valuable acquisition to rhododendron culture. Being coarse and of random sizes, in their settling there is always sufficient air space. From my observation over a period of several years there is absolutely no nitrogen deficiency problem as there is with sawdust. This may be due to the fact that chips by comparison, being so much larger than sawdust, have infinitely less surface area and in their decomposition engage relatively fewer microorganisms. This is just an assumption. Chips make a neat covering, by no means unsightly, and seem to "belong" with rhododenrons. I think they have a great future as a mulch. Commercially I have seen them used without any problems; and where they were plowed into the field after a few years, they had no noxious effect on the next crop.

There are many other satisfactory materials used for mulching and those herein described are only the most popular kinds. As the years go by we will include in the present list of mulches, new and possibly better substances, perhaps replacing what we now consider to be the best.

Conclusive experience and experiments over many years have taught us that a mulch is mandatory for successful rhododendron growing. With the exception of an odd plant here and there, I have never seen any large-leaved rhododendron successfully grown for any number of years without a mulch even though the utmost care was taken in planting. Those that needed mulching showed all the signs of de-

clining vigor: foliage smaller than normal; growth stunted or reduced to tiny spurs; leaves dull and pallid and limbs dying from disease or prolonged insect infestation. Death invariably follows after a period of years. The main reason for the decline and death of these plants was that the soil without a mulch became dry and hot, killing the fine feeding roots and the uppermost roots were chopped off when the ground was cultivated. Without a mulch and where no cultivation takes place, the soil immediately above the root area becomes hard and smooth. Although this does not act as a complete seal, it does, with the aid of soot from cars, factories, and homes, form a thin layer through which the passage of oxygen to the soil atmosphere is impeded to its detriment.

However I have seen rhododendrons flourishing without a mulch over a great enough period of time to accept the fact that under certain conditions, which are *strictly local,* combined with proper handling by experts, large-leaved rhododendrons can be raised commercially without a mulch. In the vicinity of Cleveland, Ohio, nurserymen do not use a mulch for plants lined out in the field and many use none for their young plants in the frames or beds. Plants prosper in that area under those conditions largely, I believe, due to the high water table, excellent soil and proximity to Lake Erie. Rhododendrons in the Cleveland region that I have seen do not merely exist. They thrive. Growers there with whom I have talked agree that, were it practicable to mulch older plants in the large fields, especially where no irrigation is provided, it would eliminate the occasional leaf burn on some few plants during the dry rainless summer weeks. But the fact remains that with irrigation, or with rain once a week, this burn is eliminated without mulching.

Anthony Shammarello of Euclid, Ohio, grows luxuriant plants. His one-year liners are mulched with ground sugar cane; and when they are three years old, the plants are lined out in the field. At that time they have a root system established in peat moss and soil approximately four to six inches wide and six to twelve inches deep. Once planted in the field, they receive no mulch. Mr. Shammarello's soil is neither light nor heavy and drainage is perfect. In preparing the soil for planting he first ploughs under, in the autumn, a cover crop of Sudan grass five to six feet high which lays all winter and is disked in the spring. Then in the rows in which he is later to plant, two to three inches of peat moss and two to three inches of rotted cow manure are rototilled in and worked with a subsoiler to a depth of nearly eighteen inches. After they are lined out, the plants are cultivated and hoed every week or so, as time permits. In March or April they are fertilized with a complete acid fertilizer.

I also know of a nursery in New Jersey where excellent rhododendrons are grown in the field without a mulch. Only large trees grow here and there to break the direct rays of the sun. The soil is a clay-like loam and the area has a high water table varying from possibly two to five feet, depending on the season. I am convinced this high water table and heavy loam play an extremely critical role in the ability of rhododendrons to thrive without a mulch. (The water table is the level below which the soil is naturally saturated with water. At one time there was a belief that water rose to great heights through the soil by capillarity, but experiments to determine the rise of water through a column of soil have shown that the rise does not generally exceed a few feet. The maximum ascent can not exceed eight feet. Although the rise is slower in clay-like soils, it climbs to its greatest heights in them.) This heavy loam is further enhanced in its capacity for water retention by the application of peat humus, and before planting partially rotted cow or horse manure is spread over the area and incorporated. Clay colloids, as we know, have tremendous power to absorb water and the huge surface area of clay particles (as high as twenty-five thousand square feet per pound of clay as compared to two hundred fifty square feet per pound of sand) makes clay loam ideal for ericaceous plants for which cool roots and copious moisture are vital. It should be stressed here that a clay loam is excellent, but not clay itself which is too dense for rhododendron roots.

At this nursery, the rhododendrons are grown under lath the first year, with a light pine needle mulch. They are transplanted to a woodlot the following spring, spaced eighteen to twenty-four inches on center and mulched with either shingle tow (the ends from red or white cedar shingles) or wood chips. They remain undisturbed until they are eighteen to twenty-one inch plants at which time they are transplanted, in the early spring, to fields without a mulch. They are then cultivated along the rows and weeded by hand between the plants. Nature supplies a chickweed mulch for the winter. The plants are fertilized in the spring with a complete commercial plant food. A mulch here, too, if practicable, would eliminate the small amount of leaf burn that might occur on some plants during extremely severe winters or summers.

These few paragraphs on the growing of rhododendrons without a mulch seemed to fit in with a discussion on the value of various mulches, but they must not be misconstrued to infer that I advocate that method of cultivation, for I do not. Again let me re-emphasize the condition is *strictly local.*

Concluded in May-June issue

MEMBERS OF THE NEW YORK BOTANICAL GARDEN ENJOY...
— 10% DISCOUNT —
ON BOOK PRICES

AMERICAN GARDENERS BOOKS OF BULBS
by T. H. EVERETT, *Horticulturist*
Profusely illustrated in color
Price $5.95

WHAT'S NEW IN GARDENING?
Price $3.50

MODERN GARDENING
Price $3.50

MAINTENANCE OF SHADE AND ORNAMENTAL TREES
by P. P. PIRONE, *Plant Pathologist*
Price $8.00

THE GREEN EARTH
by H. W. RICKETT, *Bibliographer*
Price $3.50

DISEASES AND PESTS OF ORNAMENTAL PLANTS
by B. O. DODGE *and* H. W. RICKETT
Price $6.00

The above books and any books relating to botany, gardening, and allied subjects may be ordered through...

BOOK SERVICE

THE NEW YORK BOTANICAL GARDEN
Bronx Park, New York 58, N. Y.

BOOK REVIEWS

TREASURY OF AMERICAN GARDENS. James M. Fitch and F. F. Rockwell. 175 pages, illustrated in color and black and white; indexed. Harper & Bros., New York. 1956. $12.50

This is a very handsome book, beautifully printed and lavishly illustrated, giving a panoramic view of gardens over America. The text is extremely interesting, both historically and horticulturally. It begins with a brief history of gardening in America, its origins and development from the first settlers to its most modern expression in the gardens of southern California and then takes up individually each one of the one hundred and six gardens included in the book. We travel by text and photograph from the Atlantic seaboard to the Pacific coast and Hawaii. The transition from the formal patterned garden of the Williamsburg period to the garden of today is well described and the social forces that made this transition inevitable.

The photography is excellent and the color beautiful, not too vivid, so that the gardens seem very real. It is high time that such a book has been published for many of the lovely gardens it portrays will not be maintained with the passage of years and to record their fleeting beauty is most important for garden history. The authors have done a great service. It is interesting that they stress the point that our colonial gardens were designed to walk to and visit, whereas the garden of today is really an outdoor living room, almost an integral part of the house.

There is a faintly disappointing quality about this volume because it is so hard to imprison, in words and photographs, the essential quality that is the essence of every garden. Perhaps this is good, for it will make the reader long to visit every garden portrayed in the *Treasury of American Gardens* and see what lies beyond each lovely vista depicted in this charming volume. All garden lovers will enjoy this book and want to add it to their horticultural library.

ANGELA MOORE PLACE
New York, N. Y.

WINDOW-BOX GARDENING. Henry Teuscher. 180 pages, illustrated, indexed. Macmillan, New York. 1956. $4.50

For one who every spring puts her house plants in two shaded porch boxes and adds a few petunias to a window box in the sun, the subject of *Window-Box Gardening* seemed hardly broad enough to fill a whole book. However, reading Henry Teuscher's book on the subject has opened the eyes of this reviewer to the almost limitless possibilities of gardening in boxes.

As Curator of the Montreal Botanical Garden, Mr. Teuscher has devoted over fourteen years to testing and experimentation in order to find the most practical methods for successful window-box gardening. This unique experience has led him to conclude that the ideal box is made of wood (preferably of pine, cedar or California redwood boards at least one inch thick) with inside depth of seven to eight inches and width of ten to eleven inches at the top, narrowing to eight inches at the bottom. Though the length of a box may be conditioned by its background, he finds most convenient a box of three to four feet long.

The author has no use for the type of built-in boxes of stone and brick which builders in this country are foisting on new home owners. These he considers mere outdoor beds, with none of the advantages of the wooden containers described.

Part I of the Teuscher book covers in detail the construction of boxes, then goes into the raising of plants from seed and cuttings, how to set them out and care for them during the growing season.

Part II, called "Extension of Window-Box Gardening" proved most challenging to this reviewer. It describes such groupings as spring bulbs, rock plants, woodland plants, roses and vegetables. For some of these combinations, Mr. Teuscher recommends the use of metal insert trays in which plants can be wintered under suitable conditions, then transferred to the wooden window boxes at the proper time for growth and flowering. This part also includes sections on plants for tubs and hanging baskets.

Part III consists of descriptions of over one hundred plants suitable for window-box culture. Mr. Teuscher begins this last part of his book by suggesting that the suitable window-box plant "should have a neat habit of growth and should flower profusely over a period of at least two, preferably three, months. Its flowers should have bright and clear colors. The plant itself should grow no taller than eighteen or, at most, twenty inches, since otherwise it is too liable to suffer from wind breakage."

The appendix which follows Part III includes lists of plants for various conditions and to produce various effects, also plants which can be grown from seed and cuttings, and those which must be stored. This section, in itself, is worth the price of the book.

Twenty pages of photographs and several line drawings illustrate boxes in bloom, also their construction, filling and other pertinent details. Anyone at all interested in window-box gardening will find this one-and-only complete manual of invaluable help, both in choosing plants and in growing them well under these specialized conditions.

ALICE L. DUSTAN
Morristown, N. J.

ALL ABOUT THE PERENNIAL GARDEN. Montague Free. 352 pages, illustrated, indexed. Doubleday, Garden City, N. Y. 1955. $5.95

By reading Mr. Free's book on perennials you share the kind of privilege which you might have enjoyed by living next-door during the months of his planning and establishing a new perennial garden.

It is easy to imagine many over-the-fence conversations relating to the selection of sites for perennials and the plants to be grown. There are careful explanations on how hardy bulbs may be used with perennials for an additional month of color in early spring, and the objections, as well as the use of tenderer bulbs, annuals, and biennials to add color during the warm months.

Chapter follows chapter as day-to-day conversations might evolve, each with helpful suggestions which could come only from a man of broad experience with plants and gardens—details of laying out beds, preparing the soil, placing plant groups and actual planting.

A major theme of the book is the conception of a specific garden and its development, so it is always personal. Its competent lessons are often related to progress on the author's Hyde Park (New York) garden. Many photographs and concise commentary serve as demonstrations.

The gardening seasons advance, and need of changes in the original planting become necessary. You learn about the capricious character of perennials. Making a successful perennial border is accompanied by difficulties, disappointments, and for the weak-hearted—heart-break. It is well to know that even for a gardener with many years of experience success is not immediate. There is no magic formula. To the earnest gardener obstacles are a challenge. Learning how to overcome these obstacles adds to the zest of growing plants, whether gardening is a means of livelihood or just a hobby.

As though in answer to inquiring neighbors, Mr. Free frequently diverts attention from progress with his own garden and talks about things of more general nature, such as garden walks and edging plants, aquatic and water-side perennials, fillers and follow-uppers and perennials outside the garden. His chapter on routine care is a dependable guide for the uninitiated. Another on propagation by seed, division, stem cuttings and root cuttings quite adequately explains how to increase perennials. Brief mention is made of a few shrubs and their place in the garden.

Of more lasting reference value, is the "Descriptive List of Perennials" and "Appendix" which come at the end of the text. Here the author first speaks of basic perennials in considerable detail, offering cultural suggestions, sharing notes on varieties he especially recommends, and giving gentle warning where a plant should be used with care. The appendix includes an extensive tabular list with botanical name, common name, family, origin, season, color and height of most perennials available in the trade. Following this are a short list of preferred perennials for tall, medium and low growth, and a more complete list arranged according to approximate mature heights. In addition, there are lists of perennials for various uses and for various environments. Perennials are also listed by color and in order of their flowering.

Perhaps the lists most valuable in the appendix are "Perennials Flowering Over a Fairly Long Period," "Perennials Which Do Not Need Frequent Replanting (those starred resenting it)," and "Perennials Usually Invasive."

For the novice who dreams of a perennial border. Mr. Free's book can be of great value. To the landscape gardener, the check-lists should be of considerable assistance. Anyone can make lists of perennials, but few are as able to select and group these plants so competently according to use.

HOWARD W. SWIFT

FLOWER GROWING IN THE NORTH. George E. Luxton. 313 pages; a month-by-month guide; indexed. University of Minnesota Press, Minneapolis. 1956. $3.95

George Luxton has written a unique book, which is what one would expect of

George. There are sound reasons for that expectation. For one thing, he has practically pioneered garden writing for a vast area of the United States—the upper Middle West. Readers of the Minneapolis Star and Tribune have come to look to him for sound advice based on knowledge, and not the usual rehash of "swipes" from older authors. Month by month, in *Flower Growing in the North,* he takes the reader through the problems of all phases of flower growing, indoors and out.

What makes this book unique is the fact that while George does borrow from the past, he does so openly and gives full credit to his source. He has learned that no one can live long enough to learn everything about plants, so scattered through the book are little gems of advice from grandma, identified by her silhouette.

A favorite of mine (which incidentally, contains a bit of information not widely known) is the one about dogs. "Grandma discouraged dogs by planting calendulas. They are rapid growers and she grew large beds. For quick, temporary relief from dogs, she would pull the plants, crush them slightly and strew them around the yard. This was done when little cousin Willie, who was afraid of dogs, was visiting. The yard was dog-free until the plants were dry. I remember I much preferred the smell of dogs to the smell of calendulas or of Willie, who smelled of perfumed soap and wore a Little Lord Fauntleroy suit."

R. Milton Carleton
Hinsdale, Illinois

THE ART OF HOME LANDSCAPING. Garrett Eckbo. 278 pages, illustrated, indexed. F. W. Dodge Corp., New York. 1956. $5.95

Mr. Eckbo's great ability as a designer is reflected in this excellent book. His analysis of basic factors to be taken into account should be most helpful to the home owner, whether his place is a bare new one or a tangled old one. The explanation of more or less technical factors of climate controls, land forms, grading, site-planning are thorough-going, yet simple and easy to understand.

The constant emphasis on the importance of plan and over-all design is a point on which all professionals will agree and too many amateurs find out too late by expensive trial and error.

The illustrations are well chosen, but are possibly too numerous as many of them are too small to be effective. It is, however, a book valuable for do-it-yourself landscape planners, for clients or landscape architects, or for students of the art.

Mary Deputy Cattell
Landscape Architect
New York, N. Y.

JAPANESE GARDENS. Jiro Harada. 160 pages, illustrated; glossary. Charles T. Branford, Boston, Mass. 1956. (Printed in Great Britain) $8.50

Our interest in the various arts of Japan has shown a persistent and substantial increase in the last few years. In both text and photographs, the author does an excellent job of explaining the theory and symbolism of the gardens of the Japanese, to whom gardening has been a very serious form of art for over thirteen hundred years. While to most of us the word "garden" means lawns and flowers, the Japanese gardens here explained and described can be said to mean a landscape design recreating one or more scenes from nature, using mainly shrubs, evergreens, rocks and water, and with virtually no flowers and no grass. The flowers of which they are so found are grown elsewhere. Much of the landscape material of the Japanese garden is in common use in the Northeast or other sections of the United States. However, while we make limited use of water as a landscape component and of rocks already in place, it is seldom that rocks of substantial size, which have to be brought in from the outside, are used. The importance of rocks aesthetically and as symbols is but one of the many items explained in this book.

Mr. Harada explains what the Japanese gardens strive to accomplish, and how. He says it is his ambition to convey "the feeling of peace and refreshment, of serenity and tranquillity and uplift which I have often felt when I gazed upon, or strolled in the gardens'" which are illustrated. Again, he speaks of the gardens he described as places intended "to recreate a landscape and infuse it with spiritual values." Also: "designers of Japanese Gardens try to infuse the spirit of nature into the (sic) creations. They still strive to suggest a sylvan solitude or seaside tranquillity, the grandeur of a tremendous gorge or the sublimity of a mighty river, the rhythmic contour of undulating hills or the peaceful expanse of a plain or a vast stretch of water. In short, they try to make the garden a place in which men may commune with nature."

This book should be of interest to all who wish to know more of what gardens mean to an artistic people who have been gardening much longer than we or our European ancestors. While not intended to be a book of explanation for those of us who would like to build a Japanese type of garden, it will give some help in this connection. Pictorially, it represents an enlargement of the predecessor, *The Gardens of Japan,* written by the same author in 1928 and long out of print and not generally available. The present volume has omitted some of the material in the earlier volume which would be helpful to those wishing to build a Japanese type of garden. This type of information is, however, available elsewhere.

Edward M. Bratter
Scarsdale, New York

MINIATURE FLOWERS AND VASES. Anne Ashberry. 189 pages, illustrated. Introduction by Noel Streatfeild. D. Van Nostrand, Princeton, N. J. 1956. $3.75

In *Miniature Flowers and Vases* several fine ideas are presented by the author, Anne Ashberry. The photography alone is outstanding, and the numerous black and white plates constitute the better portion and most interesting part of the book.

The title of the book, however, is misleading, as the flower arrangements are really small arrangements and not true miniatures limited to three inches. The title does not include the term "flower arrangements;" however, the small vase, suitably scaled plant material and a well-planned design result in a finished flower arrangement. The book is really written for small flower arrangements.

Photographs of small household articles, suitable as containers should give inspiration to many. The description of mechanics, lists of possible small plant material and the ideas on containers are well discussed. No information is given on the actual "how to" of arrangements, which would have increased the value of the book.

The utilitarian value of small arrangements showing economical use of only a few blossoms from a large cluster, and also use of roadside plant material would be of interest to many flower arrangers.

Most of the flower arrangements are informal mass in style. Changes of plant material, according to the season, does not add enough interest to this style. The repetition of the informal mass arrangement is monotonous. American flower arrangers expect more variety in design. A variety of styles and designs, both as to period and general design, would be a real asset.

This book may be of interest to the novice, but does not adhere to American trends in miniature arrangements, and the experienced arrangers will find the book lacking in new ideas and material.

Vera T. Bayles
South Orange, N. J.

FLOWER LORE. Abby Milton. 192 pages, illustrated. Dorrance & Co., Philadelphia, Pa. 1956. $2.50

Through the ages flowers and gardens have inspired the poets. The delicacy and beauty which makes flowers such a joy cannot fail to stir a multitude of thoughts quaint and beautiful. This little volume of verses, written with garden club readers in mind, runs the gamut from ageratum to zinnia, ending with a dictionary of flower symbolism. It might intrigue you to know that the oak tree in your garden spells hospitality, its leaves mean bravery, but the rhododendrons which may happen to cluster beneath it say "Danger, beware!" And you may be somewhat daunted to learn that your handsome yews stand for death. If there is a trace of Carrie Nation in your make-up, plant azaleas for temperance and surround yourself with privet which means prohibition.

There are quaint conceits in verse about what became of the cats whose tails protrude from the marsh, indian-pipe, cinquefoil, bird-of-paradise and, in fact, a great number of familiar and unfamiliar plants. There is even a cure for poison ivy!

Maybe I am too old-fashioned to like modern verse, modern painting, and modern sculpture. To me poetry means lines that scan, rhyme, and meet certain standards of composition. The extra feet which intrude upon the meter in so many of Abby Milton's "poems" jolt me as does a sour note in singing or in the playing of a violin.

Louise D. Holton
Essex Fells, New Jersey

THE COMPLETE BOOK OF GREENHOUSE GARDENING. Henry T. and Rebecca T. Northen. 353 pages, illustrated, indexed. Ronald Press, New York. 1956. $6.50

This book contains a great deal of valuable information for the gardener who has a greenhouse and for the person who is planning on building a greenhouse to grow flowers and foliage plants the year around. For the young people who love plants and expect some day to become professional gardeners, I feel that this book will be of special help.

There are suggestions for selecting, building, and equipping a greenhouse. They include the types and styles of greenhouses

location, foundation, walks, benches, heating, water, and other significant items in the construction of a greenhouse.

Important duties like watering, syringing, ventilation, temperature, light, and other points in the managing of a greenhouse are discussed, as are soil mixtures, essential elements that are needed in the soil for normal plant growth, and feeding plants by fertilizer solution which is absorbed by roots and foliar feeding.

There are well-written chapters on propagating plants from cuttings, air-layering, division and sowing seeds. Care from small plants to maturity is explained.

Plant pests and diseases of greenhouse plants and how to control them by the most up-to-date methods and the damage that is done to plants by insects and diseases are explained fully.

There are chapters on growing plants for cut flowers, plants for flowering in pots, exotic foliage plants, begonias, bromeliads, orchids, cacti and succulents, bulbs for forcing, vegetables and a number of other interesting plants.

This book also contains a generous number of photographs of plants and flowers and step-by-step procedures plus instructive pen and ink sketches.

JOHN G. BORIN

GENERAL BIOLOGY. Gordon Alexander. 881 pages, illustrated, indexed. Thomas Y. Crowell, New York. 1956. $6.75

This is a comprehensive textbook designed for a year course in college biology. The first five chapters describe fundamental characteristics of living oragnisms. Metabolism and reproduction in vertebrates are treated next. Here, with each topic, the structures and processes in a frog are described, and then compared with the corresponding condition in man. Metabolism and reproduction in higher plants are next described, followed by a section on heredity, including a chapter on human inheritance. A chapter on taxonomic principles introduces a survey of the animal phyla, followed by a survey of the plant kingdom based on the classification suggested by Tippo. Ecology, conservation and evolution, including a chapter on the evolution of man, appropriately round out the broad treatment of biology.

The material is mostly up-to-date, and although at times presented a little tediously, it is simple enough to give the student a fair idea of the processes involved. The illustrations are clear, but some are over-simplified. There are, however, some points on which the reviewer would differ with the interpretation of the author. First, on p. 49, it is implied that the reversible change from sol to gel in protoplasm is due to a reversal of the colloidal structure from oil in water to water in oil. Also on p. 344, it is stated erroneously that nitrogen-fixing bacteria fix gaseous nitrogen in the form of nitrates. But these are details. Considering the breadth of the subject, the author has given a well-balanced treatment of the many facets of biology.

HAROLD H. CLUM
Dept. of Biological Sciences
Hunter College

PROPAGATION OF HORTICULTURAL PLANTS. Guy W. Adriance and Fred R. Brison. 298 pages, illustrated, indexed. McGraw-Hill Book Co., New York. New Second edition, 1955. $6.50

This book is a revised and modernized edition of the well-known text which has been a standard reference for over twenty-five years. It is well illustrated and has a good index with several supplementary references at the end of each chapter.

The authors begin by discussing the history and development of horticulture together with an examination of the structure of plants with special reference to propagation problems. Chapter 3, in particular, is an excellent exposition on flowers, fruits and seeds. Bulbs, and other modified structures, are treated adequately in Chapter 10.

Chapter 4, on special plant growing equipment, might well have included more information on improved design of propagating greenhouses, mist humidification and artificial cooling. The possibility of utilizing synthetic films in the development of more economical and efficient propagating structures has been completely overlooked.

The authors have maintained a good balance between the various techniques of seedage, layerage, cuttage and graftage. It is a relief to read a book in which the currently popular topic of cuttage is kept in reasonable proportion and in which graftage is not ridiculously de-emphasized.

Practically all major North American horticultural crops are included in one excellent and comprehensive chapter. This detailed discussion includes stone, pome, citrus, bramble and bush fruits; grapes; tree nuts and several others. Ornamentals are not emphasized in this book, but roses are adequately treated in this chapter.

This book is obviously the result of serious study, long experience, and careful observation. It will be very valuable to students of horticulture, particularly those who are interested in fruit-growing in the South. It will also be of interest to general nurserymen, advanced amateurs, and all those who wish to broaden their knowledge of propagation procedures.

RICHARD H. FILLMORE
Dept. of Botany
Duke University

WHAT WOOD IS THAT? A. Schwankl (translated and edited by H. L. Edlin). 164 pages, illustrated; with 40 actual timber samples; indexed. Studio-Crowell, New York. 1956. $6.50

Many wood identification kits of wood blocks with accompanying pamphlets have been published for common American timbers in past years. The multivolume Hough's *American Woods* used thin veneers mounted on cardboard as a more compact method for wood illustration. Although a new edition of Hough's work is now being published, I have not seen this compact presentation in a single volume for only the most frequently used American woods. Such a volume for common European woods was compiled by Dr. Schwankl and now has been translated from the original German by a British botanist; H. L. Edlin in his own right has published several books on British trees and woodlands. Schwankl's text takes up in three major sections the general features of lumber, the methods of identification, and popular descriptions of the commonest woods of European commerce. Some of the common names are strange to Americans: afara, gaboon, lime, obeche, zebrano (all except lime being of tropical origin). Other names such as spruce, oak, larch, hornbeam, birch, beech, ash, and alder apply to the European species of genera also found in America. Still, such common American trees as red-cedar, Douglas-fir, hickory, redwood, and tulip-tree are included, as well as such garden and orchard trees as apple, box, and cherry. Both text and illustrations are admirably lucid, with frequent comments on allied American woods; a glossary of wood terms and uses provides further interest and utility. Unfortunately the text is paperbound, with a poorly glued spine. *What Wood is That?* should be of interest to garden clubs as well as amateur craftsmen. A similar concise popular presentation for the common commercial woods of the United States is much to be desired.

J. J. WURDACK

PHOTOSYNTHESIS AND RELATED PROCESSES. Vol. II — Part 2. Eugene I. Rabinowitch. Pages 1211-2088, illustrated, indexed. Interscience Publishers, New York, 1956. $18.50

This is the last of Rabinowitch's work on photosynthesis. The first volume was published in 1945 and Part I of Volume II in 1951. Though the main text of Part II reviews work only through 1954, the author compensates by citing publications through 1955 in the preface and in footnotes. The work continues the subject of "Kinetics of Photosynthesis" started in Volume II, Part I. The chapter headings are as follows: The Temperature Factor, The Pigment Factor, Time Effects (Induction Phenomena and Photosynthesis in Intermittent Light), Photochemistry of Chlorophyll, Chemical Path of Carbon Dioxide Reduction, Miscellaneous Additions and Epilogue. The epilogue contains new references and a critical discussion of old and new theories. He states that no new discovery can be hailed as the "final solution" of the problem of photosynthesis and that the complete mechanism cannot be revealed by a single new finding any more than a jigsaw puzzle could be solved by fitting one piece into its proper position.

Based on seventeen years of the author's association with research in photosynthesis and extensive study of the literature in the field, this review (both volumes involving 2088 pages) is undoubtedly an important contribution to science.

P. W. ZIMMERMAN
Boyce Thompson Institute for Plant Research
Yonkers, N. Y.

SOIL CONSERVATION. Sellers G. Archer. 305 pages, illustrated, indexed. University of Oklahoma Press, Norman, Okla. 1956. $3.75

Many books have been written in recent years dealing with the conservation of our natural resources. When another book makes its appearance, the question naturally arises, "Is this book needed?" Will it fill a place in the literature of conservation that is not being filled by other publications?

Mr. Archer's book is not primarily a technical publication, although technicians even in the field of soil conservation may obtain much information from it. It may find a place as a textbook, but its principal function will be to help develop a general, well-balanced understanding of the soil conservation movement. In this respect it fills a great need. Workers in the field of conservation have generally observed the tendency of the public to get a distorted view of the various elements that are included in the term, soil conservation.

This book will be of help to the farm owner or operator who needs guidance in developing a soil conservation plan. It

(Continued on inside back cover)

NEWS, NOTES and COMMENTS

Exhibit of Water Colors. A notable collection of water colors by Edward Lewis Peckham, of artistic beauty and charm to the lover of nature, is on exhibit in the Museum Building of The New York Botanical Garden. These are on loan from the Rhode Island Historical Society.

Peckham, son of a distinguished family of colonial Rhode Island, was an artistic chronicler of past generations as well as being the painter of five hundred exquisite representations of native plants. He traversed the picturesque hills around Providence alone and in the company of botanists of his day, and had the opportunity to study and portray a more varied flora than is to be found in any one area elsewhere in the United States.

The following acrostic, which he wrote on September 7, 1865, is reprinted from Journal of American History, Vol. 7, 1913:

Enamored of the woods and fields,
Deep bogs and shady bowers,
Where Nature prodigally yields
A varied store of flowers;
Roam I about from fancy free,
Delighted with the charms I see.

Low down the vale, high o'er the hill,
Every nook where a foot hather strayed;
Winding along some babbling rill,
In sunshine now—and now in shade;
Seeking beside its water pure,

Perchance some lily to secure.
E'en so I've wandered many a mile,
Collecting plants of every hue,
Keeping my thoughts estranged from guile,
Holding them bound to Nature true;
And here portrayed those gathered flowers,
Memorials of most pleasant hours.

Stamps Portray Plant Life. A unique collection of stamps portraying plant life is on display on the main floor of the Museum Building of The New York Botanical Garden. It has been loaned to the Garden by John Asch, author of *The Story of Plants* and contributor to many periodicals. Mr. Asch has spent a lifetime in collecting these stamps which represent issues by many governments to emphasize the flowers, fruits, vegetables, and economic plants typical of their respective countries. Many are remarkably beautiful and valuable. The collection also includes interesting and rare first day covers.

"Compositions in Seaweed." These compositions, in which Mrs. Sally Armbruster of Easthampton, Long Island, arranges natural seaweed as elements of art and medicine, will be displayed in the Museum Building of The New York Botanical Garden. Mrs. Armbruster uses the natural rhythmic motion, patterns, textures, and carefully selected shapes and varying colors to produce a semi-abstract composition, representing under-water botanical life. The effect is one of water color and pen and ink.

Mrs. Armbruster's interest began nine years ago while living in Southhold, Long Island, as a result of a day's idle collection and a chance glimpse of an old book with seaweeds employed as decorations. A botanical study of marine algae and a herbarium collection followed along with the development of the compositional collages.

Included also in this unique exhibit, opening May 11, will be several panels of an instructional nature and a selection of herbarium sheets. All the seaweeds are from east end Long Island waters.

The exhibit comes to the Garden from the Museum of Science in Boston; it has previously been seen in The American Museum of Natural History and the Donnell Library in New York City, and the Southampton, Long Island, Historical Museum.

Gifts to the Garden. Accepting the recommendations of the Advisory Council, the Board of Managers has allocated part of the generous gift received by the Advisory Council from Mrs. Thomas J. Watson to the Museum Display Committee for the completion of its projects and the balance toward the installation of a permanent replanting of the Conservatory courtyard.

The legacy of $500 under the will of the late Miss Elizabeth C. Morse has been allocated to the endowment fund for Mycologia; and the legacy of $18,000 bequeathed to the Garden under the will of the late Miss Gertrude Sturges will be treated as a restricted endowment fund—see Gertrude S. Burlingham Scholarship, page 29, January-February 1957 issue of THE GARDEN JOURNAL.

Brittonia Accepted as Official Organ of the American Society of Plant Taxonomists. Effective January 1, 1957, Brittonia, the official organ of the American Society of Plant Taxonomists, will come out four times a year and go to all the members. The editorial policies will be determined by an editorial board consisting of an editor-in-chief chosen by the Society and subject to the approval of The New York Botanical Garden, eight associate editors designated by the Society, and a managing editor appointed by the Garden. Brittonia will be continued to be published by The New York Botanical Garden, and Dr. H. W. Rickett will continue as managing editor and will be editor-in-chief the first year.

Children's Plant Workshop and Flower Show. Volunteers from the Ninth District of the Federated Garden Clubs of New York State are cooperating with The New York Botanical Garden in the Children's Plant Workshop to be held Saturday mornings, April 13 and 27 and May 4, and the Children's Flower Show on May 18.

At the session on April 13, Mrs. A. K. Bowes will instruct on propagation by seeds, cuttings, division and air layering; and Dr. P. P. Pirone, Plant Pathologist at the Garden, will show how to collect and preserve an insect exhibit and discuss the life cycle of butterflies. There will be an exhibit prepared by Dom Pirone, senior at Cornell University, majoring in entomology.

At the session on April 27, Mrs. George M. Houser will instruct the children how to make terrariums and dish gardens and how to make animals from vegetables and fruits. Mrs. Sam Lasker will teach the children about tropical fish and water plants, leaf prints and identification.

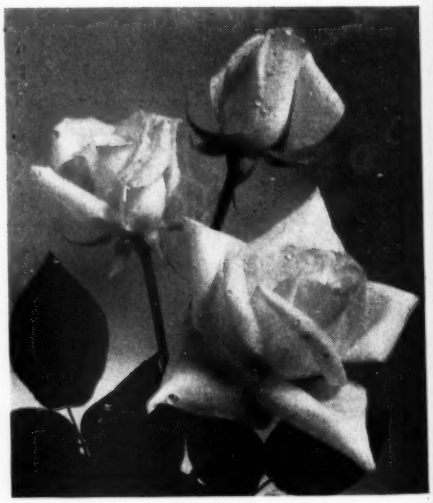
The session on May 4 will be devoted to demonstrations of flower arrangements, corsages, pressed flowers, button gardens, bird feeding and mobiles. And on May 18 the children will have an opportunity to display what they have learned in the Workshop by competing in the Flower Show.

The Workshop is designed for children up to thirteen years of age; the Flower Show provides for classes up to eighteen years of age. Applications by children resident in the City of New York and living outside the Ninth District of the Federated Garden Clubs of New York State must be made in writing to the Curator of Education, The New York Botanical Garden; by children living within the Ninth District (Westchester County) of the Federated Garden Clubs of New York State, to Mrs. Sam Lasker, 35 Birchall Drive, Scarsdale, N. Y., before April 1.

Honor to Dr. Rogers. Dr. Donald P. Rogers, Curator of The New York Botanical Garden, is serving as president of the Mycological Society of America. President-elect in September 1955, Dr. Rogers took office as president in September, 1956.

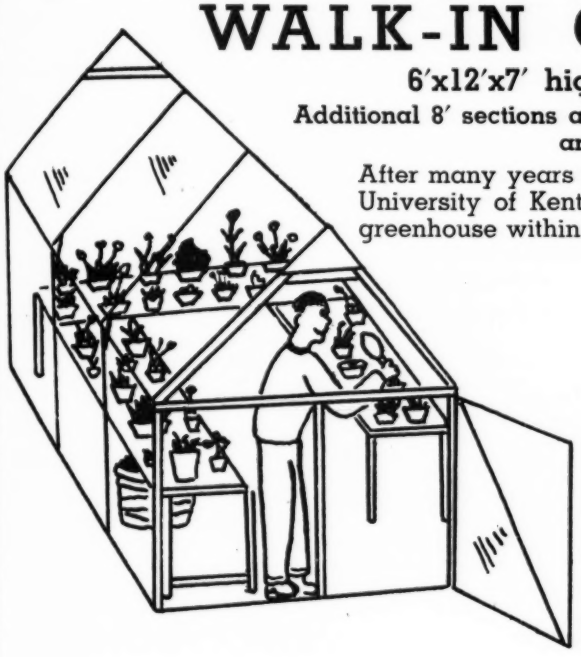
Honor to Dr. H. W. Rickett. At the meeting of the Torrey Club held at The New York Botanical Garden on February 5, Dr. H. W. Rickett was elected to the office of president and Dr. Annette Hervey, a member of the Council.

1958 All-America Rose Selections. Two floribundas won the All-America rose award for 1958: 'Fusilier' (Jackson & Perkins) with rich orange-red flowers, three to three and one-half inches across, produced in heavy clusters on a bushy plant of medium height; 'Gold Cup' (Jackson & Perkins) with fragrant three to four inch-wide flowers which retain their golden-yellow throughout the season. The bush, about two and a half feet tall, is well clothed with glossy dark green foliage. The third 1958 All-America award winner is 'White Knight,' a hybrid tea whose flowers, changing from greenish white to pure white when open, are long lasting when cut. 'White Knight' (Conard-Pyle) is the first white hybrid tea chosen by the All-America Rose Selections.



'White Night,' first white hybrid tea to be chosen for award in the twenty years of the All-America Rose Selections

AT LAST ONLY $79.95* (Reg. $89.95)
A HOME GARDENER'S PLASTIC WALK-IN GREENHOUSE 6'x8'x7' high



6'x12'x7' high model, $116.95* (Reg. $129.95)

Additional 8' sections are available in kit form, complete with parts and instructions *only* $59.95

After many years of experimentation by Dr. E. M. Emmert of the University of Kentucky, plastics have now put a home owner's greenhouse within the financial reach of all gardeners.

- **Grow prize winners**
- **Flowers all year round**
- **Sturdy construction**
- **Simple to assemble**
- **Excellent soil moisture retention**
- **Start your own seedlings**
- **Faster-growing healthier plants**
- **Inexpensive winter heating**
- **Grow exotic tropical plants**

Send for free catalog and literature

PLASTIC GREENHOUSES, INC.

520 Fifth Avenue, New York 36, N. Y.

*Special for members of The New York Botanical Garden and members of garden clubs. Add 3% sales tax if resident of New York City.

Mrs. Howard W. Maxwell, Jr., a member of the Advisory Council of The New York Botanical Garden since March 24, 1952, and of the Corporation of The New York Botanical Garden since May 15, 1952, died December 29, 1956. She had served as chairman for three Theater Benefits for the Garden and in her sudden and tragic death the Volunteer Associates of The New York Botanical Garden lost one of its vital and valued members. At their meeting on January 8, 1957, the Volunteer Associates adopted fitting resolutions in memoriam. Mrs. Maxwell was loved and admired for her wide range of interest in and knowledge of horticulture.

Miss Marian Cruger Coffin, a landscape architect who was widely known for her designs of gardens and college campuses, died February 2, 1957, in New Haven, Conn. Miss Coffin was over eighty years old.

One of her greatest achievements was the design of the gardens and grounds of Henry F. du Pont's estate in Winterthur, Delaware—now the Henry Francis du Pont Museum of American Art. As a member of the Horticultural Committee of The New York Botanical Garden, Miss Coffin landscaped the area for the Colonel Robert H. Montgomery Conifer Collection at the Garden.

Twenty-first Flower Show School, Garden Club of New Jersey. The Garden Club of New Jersey will hold its twenty-first flower show school, Course I, at its headquarters, 369 Park Avenue, Orange, N. J., March 25-27, 1957.

On Monday morning, March 25, Mrs. Milton Hescock of Mamaroneck, N. Y., will speak on "Flower Show Practice — Duties of Committees;" that afternoon, Mrs. W. Harrell Wilson of Greenville, S. C., will lecture on "Flower Arrangement."

On Tuesday morning, March 26, Dr. William E. Snyder, Chairman of the Department of Ornamental Horticulture at Rutgers University, will discuss types of plants and propagating and growing exhibition material. That afternoon Donald B. Lacey, Home Grounds Specialist with New Jersey Agricultural Extension Service, will give a demonstration on judging horticultural specimens.

Mrs. John C. Bayles, Chairman of this flower show school, Mrs. F. F. Merriam, President of the Garden Club of New Jersey, and Mrs. W. Harrell Wilson will demonstrate point scoring flower arrangements.

Arbor Day Association. The organization meeting of Arbor Day Association Inc., at the Hotel New Yorker in January 1957 marked the eighty-fifth anniversary of Arbor Day and the one hundred and twenty-fifth anniversary of the birth of its author, J. Sterling Morton. Joseph A. Dietrich, of Greenwich, Conn., was elected president; Freeman L. Parr of Hicksville, L. I., vice-president; Mrs. Elizabeth Wachs of Cleveland, secretary; Dewhirst W. Wade, of Chappaqua, N. Y., treasurer, and Harold P. Piser of Flushing, L. I., managing director.

Among those elected to the Board of Directors was the Hon. Thomas C. Desmond, State Senator of New York and a member of the Board of Managers of The New York Botanical Garden; Dr. J. C. Carter of Urbana, Ill., who contributed the article "It Shouldn't Happen to a Tree" to the September-October 1954 issue of The Garden Journal; Dr. Ray R. Hirt of the College of Forestry, Syracuse, N. Y., and Clarence E. Lewis of Long Island Agricultural and Technical Institute, Farmingdale, L. I.

Second Annual Connecticut Daffodil Show. Mrs. C. Soutar Edgar, Chairman, announced that again under the sponsorship of the American Daffodil Society, the show will be presented by ten of the local garden clubs at the Putnam Trust Co., Drive-in Office on May 1, 1957, 2-10 p.m., and May 2, 9 a.m.-5 p.m. The participating clubs are Garden Club of Old Greenwich, Green Fingers Garden Club, Greenwich Garden Club, Hortulus, Knollwood Garden Club, Mianus River Garden Club, Men's Garden Club of Fairfield County, Riverside Garden Club, Westchester-Fairfield Horticultural Society, and Women's Club Gardeners.

There will be forty-six horticultural classes and two arrangement classes. For further information, address Mrs. C. Soutar Edgar, Round Hill Road, Greenwich, Conn.

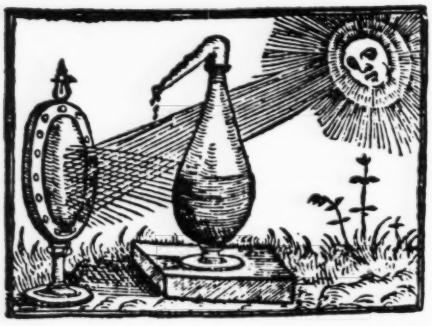
Annual Awards, Horticultural Society of New York. At the annual meeting of the Horticultural Society of New York, the following awards were announced:

Horticultural Society of New York Trophy to R. John Martin, gardener to Mr. and Mrs. William Ziegler, Noroton, Conn., for highest number of points in 1956 for horticultural exhibits.

Horticultural Society of New York Trophy to Adrian Phaneuf, gardener to Mr. and Mrs. David Heyman, Armonk, N. Y., for second number of points in 1956 for horticultural exhibits.

Evelyn Collins Hill Trophy to Mrs. S.

(Continued on page 68)



LET THERE BE HERBS

During most of the church year flowers are the appropriate adornment to the altar but during the penitental seasons, such as Lent and early Advent, herbs have a more fitting place there. Hyssop, wormwood, and rue, the bitter herbs of the Bible, are not the only fragrant foliaged species which can be used symbolically in church decoration. Legend has endowed the plants of every country with association with the Holy Family. Rosemary, in particular, is reminiscent of the Virgin Mary, whose cloak was supposed to have turned the flowers from white to blue when she spread it over a bush of rosemary on the flight into Egypt.

Actually, blossoms of rosemary in altar arrangements made before Christmas 1956 and used several weeks in the church became a deeper blue in the semi-darkness of the chancel. There are several varieties of rosemary, but the one used for this purpose had widely branching, whitish stems with palest blue flowers. The candelabra effect of the graceful branches suited the tall pewter altar vases very well.

Rosemary has been used for generations in England and the Commonwealth to decorate churches for festive and somber occasions, such as weddings and funerals. Herrick saluted the herb thus:

"Grow for two ends: it matters not at all,
Be't for my bridall or my buriall."

No altar flowers are used in the Episcopal church during Lent, but one Sunday a bouquet of winter green herbs was deemed suitable by our rector. Wormwood with its silvery leaves represented the bitterness of sin; sage leaves still clinging to the woody stems bespoke the indestructibility of wisdom, and rosemary (from the window garden) recalled the legend that the bush would grow no taller than was Christ during his earthly stay.

The drooping red fruits of native barberry with thorny stems stand for the drops of blood shed by our Lord upon the cross. They have been used in winter, during the beginning of Advent, with huge sprays of thistle or cardoon in the background. The spiny leaves of the thistle stand up straight and last a long time, if conditioned by being placed in water as soon as they are cut. Native juniper with its blue-green berries can be used before Christmas as a reminder of the cedar of Lebanon. The hyssop of the herb garden is not the true hyssop of the Holy Land according to authorities, but it is a bitter herb which can be used symbolically. Silver King wormwood is another long-lasting foliage to be used fresh or dried.

"Christ is risen, sing the flowers,
Joy is ours, joy is ours."

CLOKEY

The last Thursday in Lent, known as Maundy Thursday in England, is marked by the ceremony of distributing gifts of silver Maundy money by Queen Elizabeth. Nosegays of sweet herbs are handed to the Queen and to her husband as they enter Westminster Abbey for the rite, which includes the wearing of a towel around his waist by the Bishop of Lichfield. This recalls the washing of the feet of the deserving poor, as Jesus washed the feet of His Disciples when they celebrated the Passover together at the Last Supper. The herbs were once used to counteract the risk of infection from the plague and thus are intended to protect the Royal family.

With the arrival of Easter the altars of the Christian churches are heaped with flowers and another season of floral decoration begins. An excellent book, *Flower Arrangements for Churches* by Adelaide B. Wilson, published by Barrows, is rich in technical advice for making altar bouquets with many photographs of actual arrangements and helpful to all altar guilds. It stimulates the use of unusual materials for beauty and symbolism.

GERTRUDE B. FOSTER

NEWS (from page 67)

M. Babcock of Chatham, N. J., for highest number of points in 1956 in the amateur section.

Mrs. Charles Doscher Trophy to Mrs. Raymond R. Stoltz of Upper Montclair, N. J., for the highest number of firsts in the flower composition section in the year 1956.

Audrey Jocelyn Trophy to Mrs. F. Palmer Hart of Red Hook, N. Y., for second highest number of points in the flower show composition section in 1956.

Olga Brandon Mustain Memorial Award to Mrs. Mayson H. Tucker of Manhasset, Long Island, for the highest number of points for exhibit of white roses in 1956.

Lord & Burnham Company of New York, which has the contract for the present extensive repairs to the Conservatory of The New York Botanical Garden, celebrated its one hundredth anniversary last year. Frederick A. Lord began constructing greenhouses for amateur gardeners in 1856, and in 1869 Lord's daughter married William Addison Burnham who was later to become a partner in Lord & Burnham Co.

In 1877 Mr. Lord went to California to build a conservatory at Golden Gate Park in San Francisco; in 1881 he built the first steel-framed greenhouse in this country for Jay Gould on his estate in Irvington, New York. Ever since then Lord & Burnham Co. has been building ranges of glass for commercial enterprises, conservatories and greenhouses for botanical gardens (for example, The New York Botanical Garden and Belle Isle, Michigan), greenhouses for horticultural instruction and research (for example, Michigan State College at East Lansing), and for many large estates and smaller home properties throughout this country.

On Begonias. "Mrs. De Coursey's article on begonias in the January-February 1957 issue of THE GARDEN JOURNAL was excellent. If anyone is interested, I, too, have kept a list comparable to hers of the number of months of non-stop bloom of certain begonias, headed, as is hers, by 'Preussen,' which is now in its seventh year for me!"

Nineteen fibrous-rooted begonias which have remained in constant bloom for two years or more:

Begonia	*No. months of bloom*
Preussen	76
'Sachsen'	71
coccinea hyb.	61
'Diana'	55
'Sylvia'	52
picta rosea	47
'Noordi'	45
'Bayern'	43
'Elaine'	42
'Catalina'	34
'President Carnot'	31
'Lecco'	30
'Marie Holley' (bulbous)	29
'Bennett'	28
oadi	27
coccinea	26
odorata alba	26
'Minute'	25
'Lawrence Fewkes'	24

MARJORIE WIHTOL
Middletown, N. J.

Errata. There is confusion in names in the "Among Our Contributors" column in the January-February 1957 issue of THE GARDEN JOURNAL. The Mrs. Thacher is not Mrs. Thomas D., but Mrs. Alfred B. Thacher of South Orange, New Jersey. The latter is also a member of the Garden Club of America, holder of its achievement award, and well known throughout the country because of her fine collection of more than a hundred varieties of hollies growing on her place in South Orange.

Remember **BOBBINK & ATKINS** *for the*

NEWEST of the All-American Roses
OLDEST of the charming historical Roses
See them in The New York Botanical Rose Garden

Our complete catalogue, "Garden Gems," not only illustrates and describes ROSES but also hundreds of choice HARDY PERENNIALS for all-season blooms; also the unusual EVERGREEN TREES and SHRUBS, AZALEAS, RHODODENDRONS, PIERIS, PYRACANTHAS, and a host of other rare plants not available elsewhere.

BOBBINK & ATKINS
Quality Plants for Your Garden
401 Paterson Avenue East Rutherford, N. J.

VISITORS INVITED to our GARDEN CENTER and NURSERY MARKET

BOOK REVIEWS (from page 65)

will be extremely enlightening to the urban dweller who wishes to obtain a better understanding of this field.

The arrangement of this book is very effective, section headings including: I—The Field of Conservation; II—Planning for Soil Conservation; III—Crop Land Treatment; IV—Grassland Agriculture; V—Farm Forestry; VI—Natures Acres or Wildlife on the Farm; VII—Special Programs in Soil Conservation; VIII—Public Assistance in Conservation.

The section on Special Program includes up-to date information on the watershed program, a very good section on irrigation, and another on farm drainage. One of the most useful portions of the book is the last section on Public Assistance in Conservation. This section is particularly needed since most people are confused because of the many agencies which are working in this field. Many farmers, too, do not understand the nature of the assistance which they can obtain from the public agencies which maintain offices right in their own counties and do not know what steps to take to obtain this assistance.

The author has shown not only a comprehensive knowledge of the many details connected with the soil conservation movement, but he has also developed some very sound philosophies which should be recognized by people who read this book.

W. F. PURNELL
Ext. Soil Conservationist
University of Illinois
Urbana, Illinois

A NEW COURSE OF PLANTS AND ANIMALS. M. A. Grigg. 216 pages, illustrated, indexed. Cambridge University Press, New York. 1956. (Printed in Great Britain) $1.50

This is a biology text for secondary schools in England and will be of little use to any American student or teacher. British words such as shingle (for gravel), British spelling, and frequent references to British plants and animals make reading the book a constant problem in terminology and nomenclature. The drawings in ink are clear and numerous. Considerable space is given aquatic plants and animals.

ROMAINE F. BUTTON
Office of Elementary Science
and School Gardens
Board of Education
New York, N. Y.

THE FLOWER ARRANGEMENT CALENDAR 1957. Helen Van Pelt Wilson. M. Barrows, New York. 1956. $1.25

The Flower Arrangement Calendar by Helen Van Pelt Wilson is eagerly awaited every year. New and former contributors known for their floral artistry make the 1957 edition an attractive resume of arrangements for home, church and flower show.

A YEAR OF FLOWERS. Rachel E. Carr. Japanese Flower Arrangement Engagement Calendar. Chas. E. Tuttle, Rutland, Vermont. 1956. $2

A Year of Flowers — an engagement calendar — is illustrated with examples of Japanese flower arrangements by Rachel E. Carr. Mrs. Carr, raised and educated in China, has been living in Japan for several years. She has seriously studied the art of flower arrangement in Japan — in both modern and traditional styles — and is author of *Stepping Stones to Japanese Floral Art.*

WEDGWOOD PLATES

Exclusively made for the Garden

The individual design for each plate — a native American flower — has been drawn by a notable British botanical artist. The design, black on white, is encircled by a Patrician border.

Available Now, Set of Four Plates

Azalea nudiflora **Cornus florida**
Liriodendron tulipifera **Trillium grandiflorum**

$12.50

Another Set of Four Plates

Aquilegia canadensis **Nymphaea odorata**
Cypripedium acaule **Lilium canadensis**

Will Be Ready for Christmas 1957 Delivery

These plates will make an interesting addition to your own China collection, or attractive gifts.

Special Discount to Members of The New York Botanical Garden

Send your order to

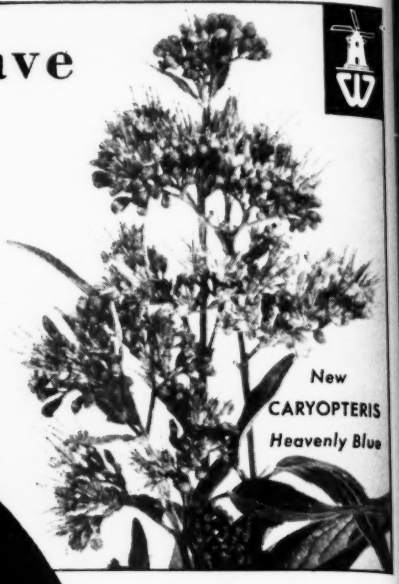
THE NEW YORK BOTANICAL GARDEN
Bronx Park, New York 58, N. Y.

These distinctive plates are only one of the many services we are rendering to make membership in The New York Botanical Garden continually more valuable. Why not avail yourself of this wonderful opportunity?

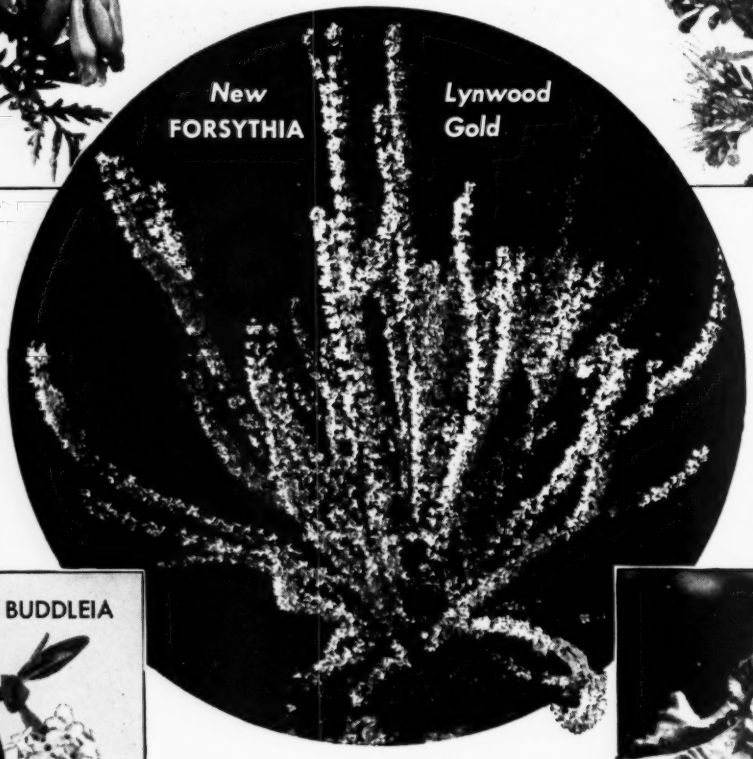
Your garden can have endless variety

Gardeners who want peak performance and variety in their garden just naturally turn to Wayside, the nursery whose reputation for supplying horticulture's newest and best is famous from coast to coast. This spring, Wayside's catalog features over 1800 magnificent items. New roses, flowering shrubs, rare bulbs, trees and hardy *"Pedigreed"* plants, all grown and rigidly tested in America's most carefully supervised nursery.

New BLEEDING HEART *Bountiful*



New CARYOPTERIS *Heavenly Blue*



New FORSYTHIA — Lynwood Gold

New BLEEDING HEART

Bountiful. From thousands of seedlings, this dazzling new star was discovered right here at Wayside. It's the finest "Bleeding Heart" ever created. Blooms perpetually all summer, reaching its peak in May and Sept., when 30 to 40 brilliant, fuchsia-red flower stalks bloom on a single plant. Sturdy plants with feathery, dark, blue-green foliage are hardy and easy to grow.

New CARYOPTERIS

Heavenly Blue. Graceful new shrub that satisfies the desire for blue, a very rare and desirable color, especially in the autumn garden. Upright in growth, mature shrubs are 15" wide and 24" tall, and produce 30 or more exquisite, deep blue flower spikes on a single plant. *Heavenly Blue* is a new dark blue form of Caryopteris, *Blue Mist* another exclusive Wayside introduction.

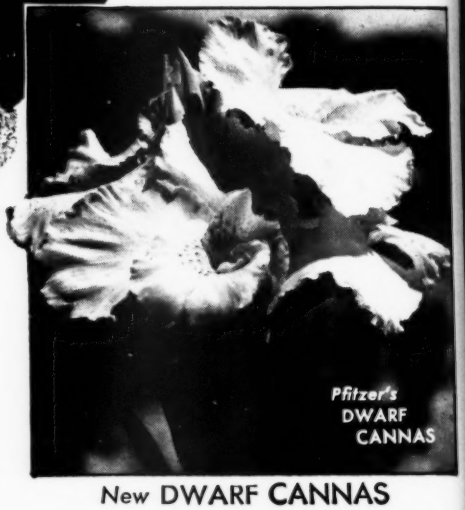
New BUDDLEIA *Hever Castle*

New FORSYTHIA

A sparkling, new, gold-flowered Forsythia that is certain to replace all other deep yellows. Erect branches are completely covered with golden, yellow blossoms from top to bottom. Larger, fuller flowers of unusual substance bloom profusely, unmindful of bad weather. Superb for cutting and flowering indoors during winter months.

New BUDDLEIA

Hever Castle. A very beautiful and completely distinct version of the popular "Butterfly Bush". Originated at Hever Castle, residence of Lord and Lady Astor, it won the Reginald Cory Memorial Cup for best hardy shrub of the year. In June and July, this bushy, dense shrub is covered with deliciously fragrant, globe-shaped, lavender blossom clusters. Withstands below zero temperatures. Does not die back. Patent applied for.



Pfitzer's DWARF CANNAS

New DWARF CANNAS

First truly dwarf Cannas to date. Developed by Wilhelm Pfitzer, famous German hybridizer. All summer long, compact plants produce immense flower clusters in lovely, soft pastel shades. Stunning in tubs for porch, terrace or roof garden decoration since they grow only 2½ to 3 ft. tall.

SEND FOR THE WORLD'S FINEST HORTICULTURAL BOOK-CATALOG

To get your copy of America's favorite catalog, please enclose 50¢, coin or stamps, to cover mailing and handling costs of this heavy book. It has no equal. . . . Almost 200 pages, with hundreds of true-color illustrations and helpful cultural directions. It features over 1800 of the world's finest garden subjects . . . prize-winning roses, flowering shrubs, ornamental trees, rare bulbs and hardy *"Pedigreed"* plants that have been grown and rigidly tested in America's most carefully supervised nursery. Send for your copy of this outstanding catalog today.

SPRING PLANTING CATALOG
Over 200 pages
Mailed Jan. to June

Wayside Gardens

91 MENTOR AVE. MENTOR, OHIO

FALL PLANTING CATALOG
Almost 130 pages
Mailed July to Dec.